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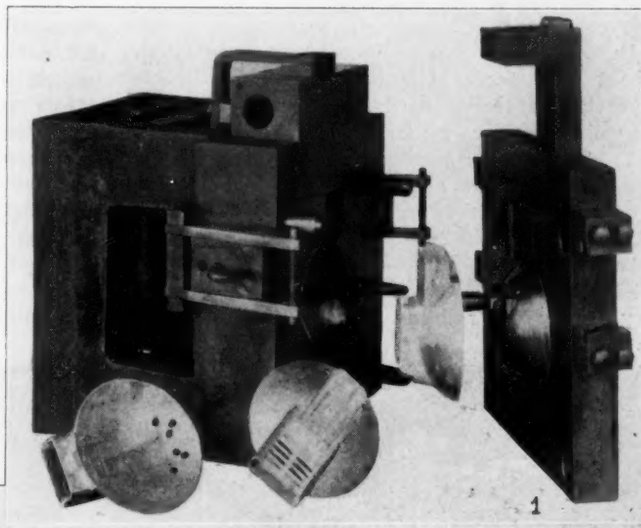
Die Casting Employed for Making Wide Variety of Parts

By Herbert R. Simonds

PERHAPS in no other product in the world has the urge to reduce labor cost been so strong as in the case of the automobile. Each part entering into the production of the modern automobile has been analyzed and reanalyzed to determine the method of producing it at the lowest possible cost, until today each part for its purpose is an example of the survival of the fittest. Forgings, stampings and castings in addition to rolled steel forms joined by welding and die castings all have their proper functions to fulfill. The latter items are comparatively recent developments; they were unknown at the time the first automobile was operated. From 30 to 40 parts on a typical automobile today are made of die castings. A few of these are the motometer frames, the carburetor parts, ignition and lighting system parts, magneto housings, and steering wheel supports. In the manufacture of sewing machines, cash registers, pianos, motion picture machines and other products die castings are widely employed and the industry is expanding rapidly. This development is well illustrated in the history of the Newton Die Casting Co. which recently moved into a new plant at New Haven, Conn. To a large extent the history of this company centers around the activities of William G. Newton, whose vision and tireless energy have contributed much to the die casting art. After eight years



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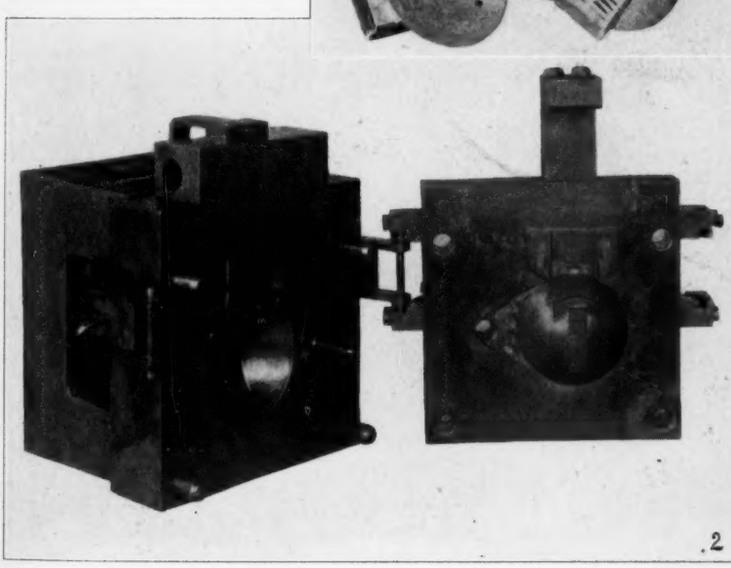

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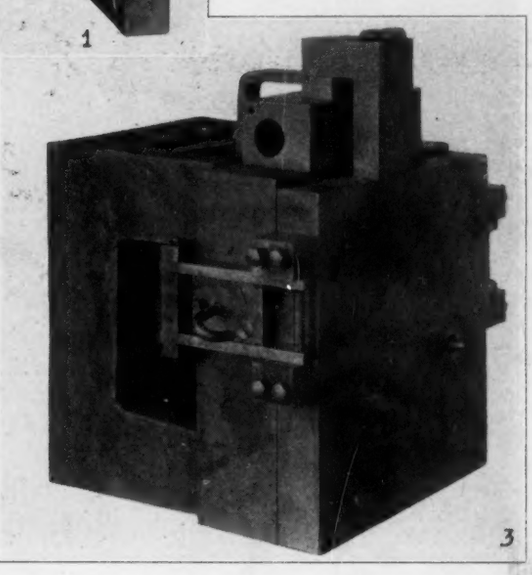

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Fig. 1—Dies for making die castings usually are made from solid steel blocks. Fig. 2—Method of gating is shown in this wide open die. Fig. 3—Same set of dies shown in Figs. 1 and 2. The gate is shown at the right. This die produces an aluminum part for a miner's lantern

Fig. 4—Portion of finishing department where the castings are sorted, inspected, cleaned and placed in containers ready for the shipping department

of experience, in various phases of die casting, Mr. Newton took over the management of the Marf Machine & Die Casting Co., Brooklyn, N. Y., and in a period of less than five years increased this company's production by more than 600 per cent. Toward the end of last year, he was instrumental in bringing about a merger of the Marf Machine & Die Casting Co. and the die casting division of the National Lead Co., both of which companies operated plants in Brooklyn, N. Y. The new company, known as the Newton Die Casting Corp., recently closed both of these plants and transferred all manufacturing activities to a 6-story reinforced concrete building at New Haven, Conn.

This new plant is the first die casting plant to operate in New England and, as it is the newest die casting plant in the country, and the only one to be completely planned as a unit upon experience through gradual development elsewhere, much interest attaches to its operation.

The building now occupied was erected during the war for the manufacture of light munitions but it has proved singularly well adapted to die casting requirements. The building extends for 500 feet along the siding of the New York, New Haven & Hartford railroad. At one end there is a spacious shipping platform where the various products of the plant are assembled for loading into freight cars for shipment to all parts of the country. At the other end is the unloading platform where the raw materials enter the plant. Raw materials for a die casting plant consist chiefly of pig aluminum, zinc, lead, tin and other metals, steels of various grades for use in construction of dies and cores, and tools for the machine shop. Of course, many other materials enter any plant with such varied activities as those of a large die casting establishment. Boards, barrels and packing cases are required in large quantities for shipping the plant products and

Fig. 5—Aluminum die casting department occupies the entire top floor of the building with rows of die-casting machines extending down both sides

large quantities of water, oil and gas are constantly being consumed. The city gas consumption at the Newton plant reaches the surprising figure of $60,000 a year.

The flow of material through the plant has been well planned. The incoming material is received and stored on the ground floor. At the far end of this floor is the metal mixing department. Here a bank of gas-fired tilting crucible-type furnaces convert the pig metals and the sprue from the plant into alloys suitable for die casting. The alloys in the shape of pigs are carried by elevators to the upper floors of the building where they are distributed to the various machines by electric lift trucks. The top floor is the aluminum casting department. Here on two sides of a long well-lighted room are the rows of aluminum casting machines. These are specially designed and specially built machines. The principle, however, is similar to that for any aluminum die casting process. The alloy is melted in a large reservoir at one end of the machine, (the window end in this plant). The main frame of the machine carries the die with the elaborate mechanism for the placing and withdrawing of the various cores, for the closing and opening of the die, and for the ejection of the casting after it has been made.

Having once designed and built a die and its auxiliary mechanism and adjusted this to a die casting machine, the sequence of operations is relatively simple. The open die, mounted on a movable die carriage, is cleaned out with a handy jet of compressed air. The parts then are closed and the cores moved in place. This placing of cores is frequently an automatic process controlled by the opening and closing of the die parts or by the movements of the complete carriage up to the nozzle of the metal reservoir. When the closed die with cores set has been clamped against the nozzle, then in the phraseology of the shop, it is given a shot. This means that the air pressure is turned on forcing the molten metal through the gate of the die until the die itself is completely filled. For aluminum, the temperature of the molten bath is about 1250 degrees Fahr. The air pressure used ranges from 450 to 500 pounds per square inch. The liquid metal fills all of the cracks and spaces in the die and surrounds the steel cores. After the air pressure has been sustained for an appreciable interval, the pressure is turned off and the die withdrawn from the nozzle.

Part of the science of die casting is the time element between filling a die and ejecting the cooled casting. It is important that the casting be cooled just enough but not too much. In order to speed up the cooling of the casting and also to keep the die steel cool, circulating water is run through all of the heavy sections of the dies. A typical die opened to show its construction, is illustrated in Fig. 1. The casting, which in this case is a lamp reflector part, is shown in the position it would occupy just after being ejected. The water circulating opening may be seen on top of the left hand part. Fig. 2 gives another view of this same die, showing the method of gating and Fig. 3 shows the die closed ready for the metal. The gate may be seen at the right.

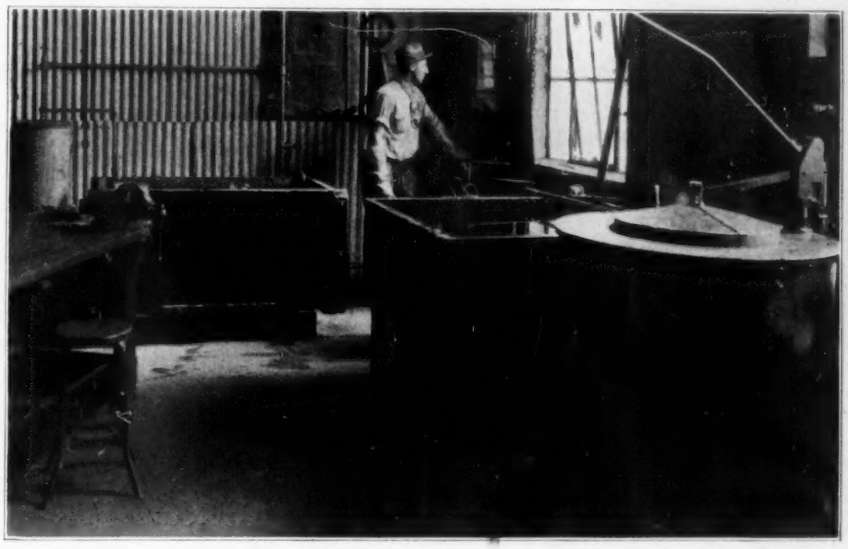


Fig. 6—Dies must be subjected to careful heat treatment to insure long life under the use to which they are put

The floor below the aluminum department is the zinc, lead and other soft alloys casting department. This has two long rows of casting machines similar to those on the top floor. However, there are differences in the design of the machines themselves due to the lower temperature employed. Zinc alloys are held from 800 to 850 degrees Fahr. in the reservoirs.

On the third floor from the top is the diemaking machine shop. This, as may be imagined, is a large department equipped with modern machine tools. An important feature of this department is the heat-treating room. This room is equipped with thermostat controlled, gas and electric furnaces with oil circulating quench tanks and other equipment called for in modern heat treating plants.

Dies, in a die casting plant, take the place of molds in a foundry, yet in one sense they more logically correspond to the pattern. They are made up for each individual job and then are stored in a die storage room until again called for. The average cost of dies for one casting is about $500. Some, of course, cost between $2000 and $3000 each.

Although dies are considered a necessary evil in the die casting business, they are paid for to a large extent by the consumer and, in this respect, the die casting plant has an advantage over the sand casting foundry because the practice of having the customer pay for the pattern in a foundry is not well established in the industry.

The proper storage and handling of dies in die casting plants, however, is an item of no small expense. As the shop grows, the filing system becomes more elaborate. A safe place must be provided for their storage and insurance must be carried. In order to keep the stock down to as low a point as possible, the Newton Die Casting Corp. has a scheme of discarding old dies. Dies, which have been in storage three years without being used, are called obsolete and their cards automatically come up for attention. A letter is then written to the customer pointing out that the die has now been placed on the obsolete list and that it will be destroyed unless advice to the contrary is received. After this notice has been sent out, and in case no reply is received, the die in question is taken from the storage and put in a suspense or obsolete storage pile where it is allowed to remain for about a year before being destroyed. The main die storage room at the Newton plant is estimated to contain dies valued at $3,000,000 or more.

In addition to the dies used for castings, it frequently occurs that other dies are called for in the fin-

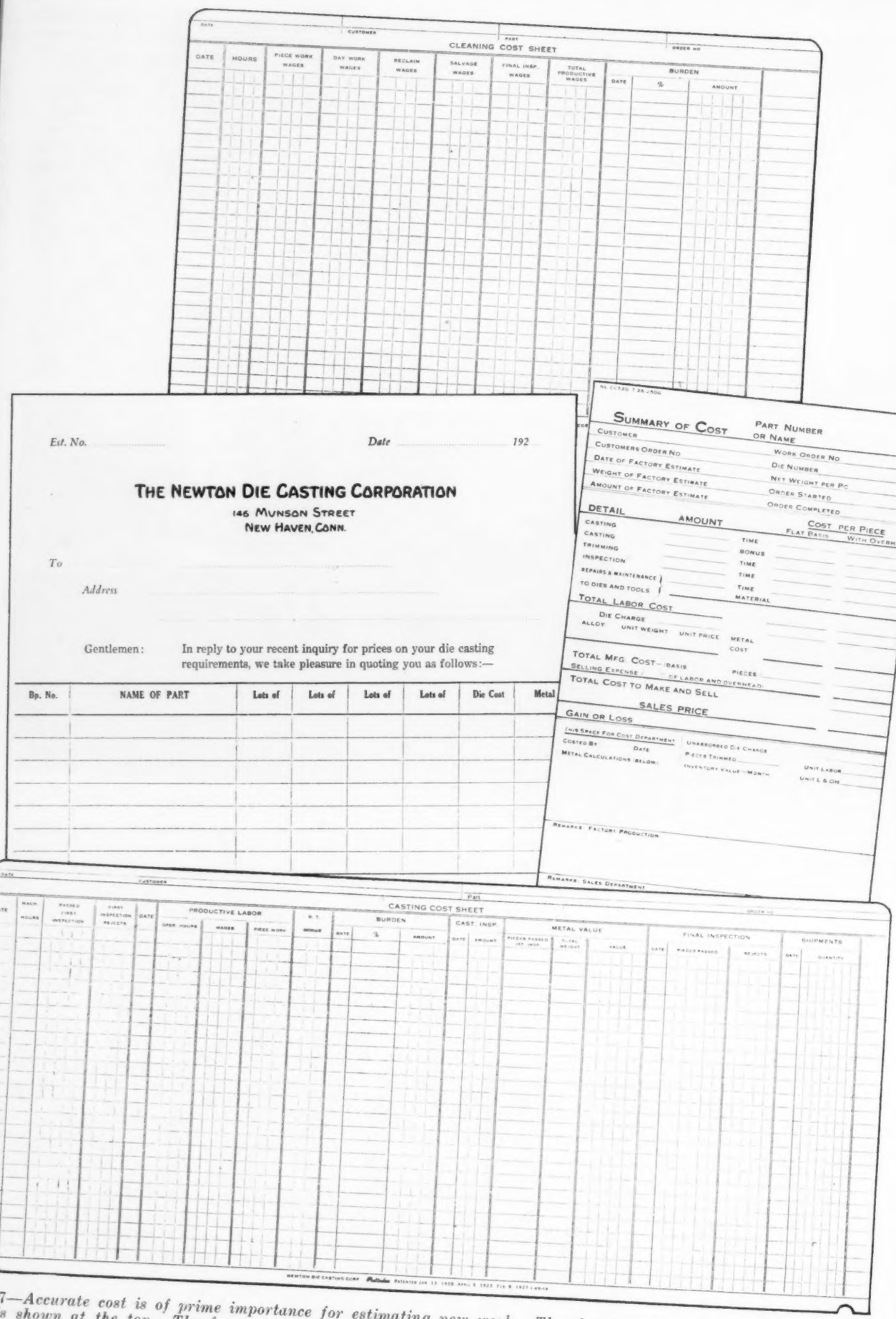


Fig. 7—Accurate cost is of prime importance for estimating new work. The sheet employed for keeping the cleaning cost is shown at the top. The form on which quotations on a die casting requirement are forwarded a customer is shown at left center. A summary of the cost of a job is recorded on the form shown at right center. The form employed for recording the cost of casting metal is shown at the bottom

ishing or cleaning operations. These while less complicated also call for accurate work and are made in the general machine shop. They are used mostly for trimming the fins which sometime occur at the joint between die parts.

Two floors constitute what is called the cleaning department. In reality the castings here go through many finishing operations including some light machine work, and some assembling. The plant is operated chiefly as a jobbing shop and makes parts rather than complete articles. There are a few exceptions to this practice and the company has recently started a manufacturing department in which certain articles are turned out for direct sales.

Other parts of the large plant are occupied with the toolroom, the packing and shipping department, the steel storage room where alloy steels for diemaking are stored, and the power plant. Special attention has been given to this latter department. The whole operation of a die casting plant is dependent upon an adequate source of high-pressure air. A failure in the air supply and the plant instantly becomes idle. Therefore, to guard against such danger duplicate compressor equipment has been installed. Some idea of the piping necessary in a modern die casting plant may be secured from a brief description of one of the die casting machines.

Fig. 5 shows a portion of the aluminum die casting room. From this an idea of the arrangement and the long rows of die casting machines may be had. The machine in the foreground clearly shows the die carriage and the hydraulic plunger which operates it. The pot containing the liquid aluminum alloy is at the window and, just behind the sheet iron partition. The pots vary in design, but the usual type for aluminum work at the Newton plant is a tilting pot, that is, the metal chamber tilts. In most cases, it is a smaller chamber inside of the main pot which tilts or raises to fasten against the die gate opening. Because the metal chills rapidly when it comes in contact with the die, it is important to apply sufficient pressure to the metal before it enters the die.

Speed Is Essential

The finish of the casting is largely dependent on the speed of this operation. To insure this speed, air pressure, as has been stated, at nearly 500 pounds per square inch is used. A typical machine must be piped for this high-pressure air and for the high-pressure water for closing the die, and for adjusting the core and moving the whole unit up against the metal spout. It also must be piped for low-pressure water for cooling the die, must be wired for electricity and piped for gas, for light and for a fan for fresh air for the operator. Then there is the gas supply and in addition a low-pressure air system for cleaning out the dies after the casting has been ejected. Thus, there are five independent piping systems connected with each die casting machine and one electric conduit. The power plant is the central point where all there various systems originate. Fig. 6 shows a corner of the heat-treating department. It will be noted that there is an overhead trolley rail for transporting material to be treated to the various furnaces and quenching tanks.

The extent of the tool room is clearly indicated in Fig. 8. A large part of die work is bench work, and for this reason a bench extends the full length of the building directly in front of the large windows. This department might well be regarded as an independent manufacturer. Its complete product is the highly specialized die casting die. The life of the whole organization centers around the die. Dies of poor construction, faulty material or improper design will quickly use up all the profit in a fairly sizable job. For this reason the dies are built for endurance with little regard to expense. For quantity production the best possible die is the cheapest in the end.

Some time ago, a large manufacturer who was making his own die castings on a rather small scale was having difficulty and asked an official of the Newton company to explain why his castings were cracking. He was told his difficulty might be:

1. Hole in insert fitting too snugly on core so that when core is withdrawn strain is put on casting.
2. Hole in insert too large allowing metal to flow between insert and core. This small flash of metal possibly accumulating and causing next insert to fit too tightly.
3. Outside diameter of insert fitting too snugly in sleeve core causing strain when core is withdrawn.
4. Outside diameter too small permitting metal to flow between insert and sleeve core. This metal possibly accumulating and causing next insert to fit too snugly.
5. Inside diameter and outside diameter of insert not concentric.
6. Metal temperature not correct.
7. Die temperature not correct.
8. Casting production not at proper speed possibly permitting casting to remain too long in die before ejecting.
9. Die not lined properly.
10. Machine not lined properly.
11. Possibly wear in dowl pins per-

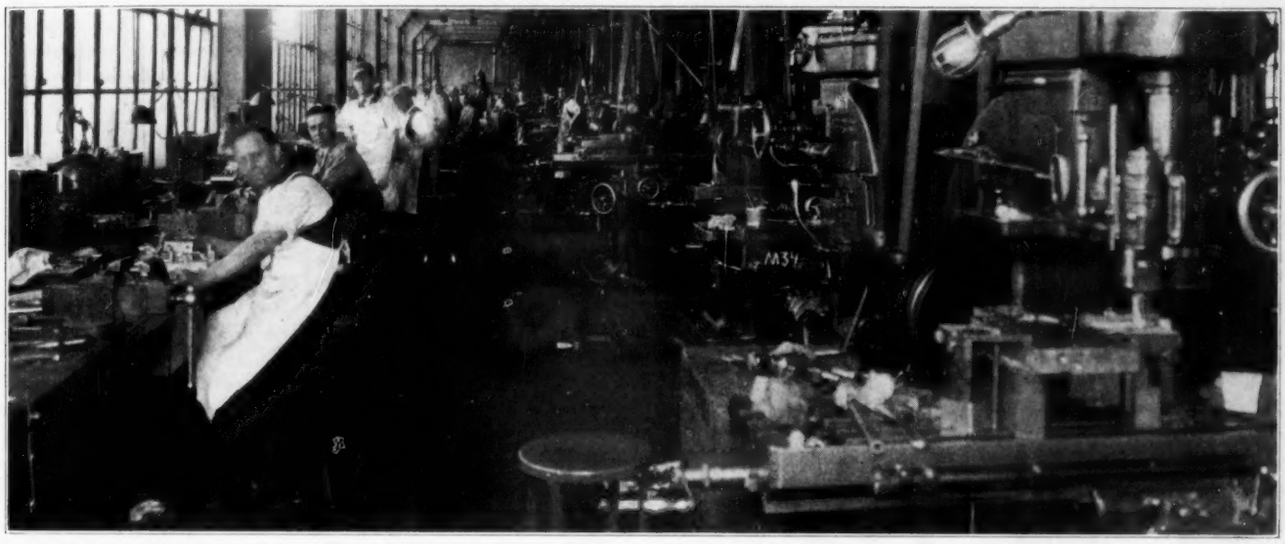


Fig. 8—Partial view of the machine shop which is required for the precision work in the construction of steel dies

mitting upper half of die to drop slightly when being opened.

12. Bent core pin in insert.

13. Undercut in die caused through closing die on chips or flashes of metal from previous shots.

14. Wear in ejector guides causing casting to be ejected unevenly.

15. Upset end of cores.

Wherever possible the dies are cut from solid blocks of steel. This is often more expensive than building a die of two or more parts, but it avoids much difficulty. Molten metal under pressure has a way of getting into the smallest cracks and a die made of several parts may start the day with a perfect fit which cannot be detected, and may end the day with a crack large enough to cause objectionable fins on the casting. Dies are heat treated carefully to relieve internal strain and protect the surfaces from the action of the molten metal. During the life of the die for zinc and lead alloy work 500,000 castings frequently are made.

Even though the production of accurate castings is of first importance in the die casting business, there are other important features. One of these is cost accounting. The die caster is faced with the same difficulty in estimating cost of new work that confronts the sand foundryman.

In securing a new piece of work, the procedure is somewhat as follows. The first thing to determine is whether the job falls properly in the field of die casting. First, comes the question of weight. A large piece arbitrarily is discarded as a possibility, because the die casting art as at present developed has definite limits as to size. Approximately 12 pounds is the maximum weight to be considered. Of course, the die casting salesman does not immediately turn his back on an overweight job. He first considers whether the weight can be reduced to come within the die casting limits. If not, he determines whether the commodity can be made efficiently in two parts, each of which might be a die casting. The next consideration is the number of pieces required. If the number is low, economic considerations immediately throw this job out of the die casting field. For one thing, a die cost ranging from $500 to $1000 will be incurred before the first casting is made.

The next consideration has to do with strength and material. Die castings at present are made only of metals or metal alloys having certain definite properties. In general, die castings are limited to zinc alloys, tin alloys, lead alloys and aluminum alloys.

Having determined that a certain product is of the right weight, that it is to be made in sufficient quantity and that it may be properly made of one of the usual alloys, the next question is to determine the design of the die. Experience and ingenuity combine to make it possible to build a die for almost any conceivable shape of casting. However, when the casting itself has too many undercuts and complicated cavities the construction of a die may be impractical, either because of its original cost or of the cost in production of the work. However, if the design seems to indicate that a suitable die may be readily constructed, the next step is to make up an estimate of cost from which a quotation to the customer may be made. Before the quotation is sent, the estimate is checked carefully against previously completed jobs of a similar character. The quotation is sent out on the form shown in Fig. 7.

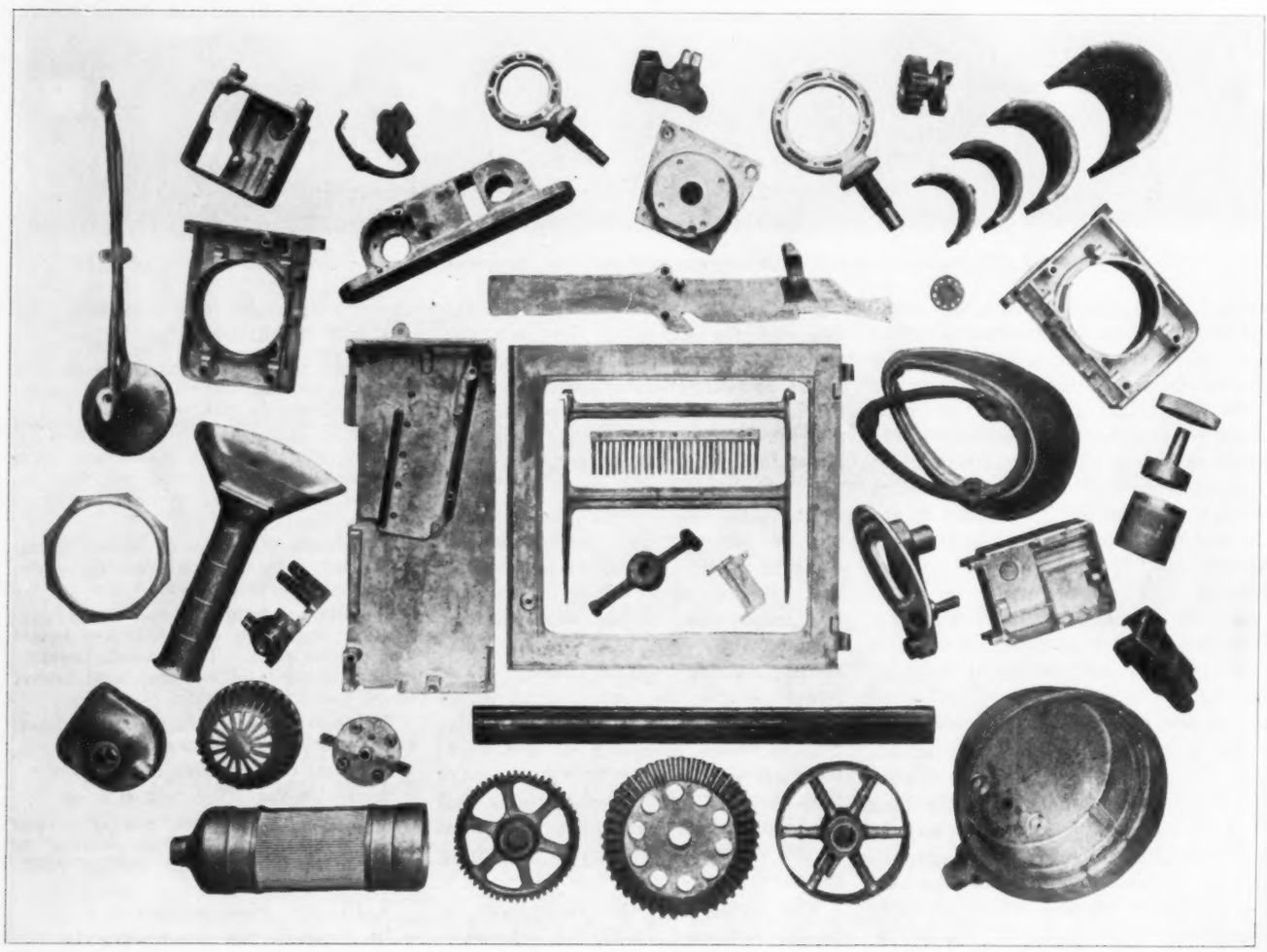
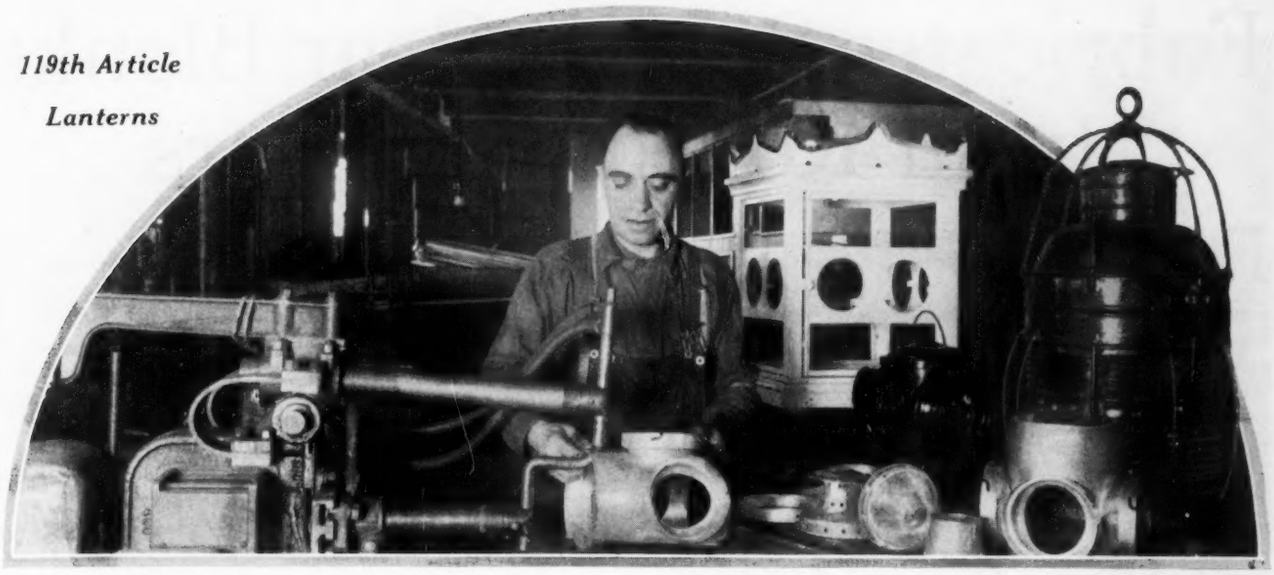


Fig. 9—A few of the commodities made in die casting machines which depict the varied character of this industry

119th Article

Lanterns



The common type of lantern is made of sheet steel stampings assembled by the electric spot welder

Large Uses of Steel in Small Ways

DESPITE the extension of electical service to rural communities the humble lantern still is used in large numbers on farms. Even in Illinois, where the story of the Chicago fire is ever a reminder of the danger of a lantern near a cow, annual sales of lanterns to farmers run into many thousands. Of course, the term "lantern" covers a wide field and includes many styles of portable electric lights which are extremely popular not only for camping and similar purposes but for watchmen and caretakers of offices and industrial plants in this country.

Under the general heading of lamps the census report shows over $31,000,000 as the value of products manufactured each year. This is exclusive of motor vehicle headlights. Of this large number, only a small portion falls under the classification of lanterns, but the lantern production is surprisingly heavy. One manufacturer who has specialized in lanterns for nearly 50 years makes about 10,000 a year. About half of this manufacturer's lanterns go into the railway field. All are made of sheet steel. The railway lanterns are made of heavy autobody stock, usually 20 gage or heavier. Some of these lanterns are made from galvanized stock, but when intended for outdoor use they are first made up and then given a heavy coating, half tin and half lead.

The average weight of the various lanterns made by this manufacturer was found to be 15 pounds, of which amount 11 pounds was steel, the balance being glass and brass and other materials. This approximates an annual consumption of more than 50 tons of steel, mainly sheet and strip steel.

The various parts are punched out and then formed under dies and are later assembled with the electric spot welder. The assembly operation is shown in the illustration. Many of the lamps are given a finish coat of a special water resisting paint and some styles, particularly electric lanterns, have an enamel coating which is baked for several hours at 300 to 325 degrees Fahr. One manufacturer estimates the total tonnage of steel entering into lanterns as in excess of 1000 tons each year.

Included in such a tonnage would be miners' lanterns of special design and the vast array of low price lanterns which may be found in any general country store. Galvanized and tinned wire is used extensively in the construction of lanterns and the assembling of parts is usually accomplished without resorting to the spot welding process.

An item not included in the census reports under the heading "lamps" and certainly not usually thought of in connection with lanterns is the tissue paper or Japanese lantern. Practically all of these have a steel candle holder, sometimes a pressed cup but more often a thin coiled strip.

THIS is the one-hundred nineteenth of a series of articles dealing with some of the obscure uses of steel which go far toward absorbing the American tonnage.

Among articles appearing every two weeks and not included in Vol. I containing 51 separate descriptions are:

Vacuum Bottles	*Suspenders*
Highway Guards	*Screw Hooks*
Numbering Machines	*Steel Bridging*
Joist Hangers	*Mail Boxes*
Straight Razors	*Steel Shelving*
Piano Wire	*Automobile Bumpers*
Type Molds	*Tire Chains*
Swords	*Bathroom Fixtures*
Paving Guards	*Snow Fences*
Reaction Kettles	*Stairs*
Fire Screens	*Cork Screws*
Voting Machines	*Universal Shafts*
Display Racks	*Sewing Machines*
Steel Stamps	

New Road Links Steel to Tidewater

Interstate commerce commission has authorized the Pittsburgh & West Virginia railway to construct an extension of its lines in Allegheny, Washington, Westmoreland and Fayette counties, Pa. The commission says the extension will provide permanent connection between Pittsburgh and West Virginia and western Maryland so that they may, in combination with Wheeling & Lake Erie and possibly the Wabash, furnish a new and independent through route from steel producing territory, Lake Erie, and points beyond to the port of Baltimore.

Fabricates Starter Gear Blanks from Rolled Steel Bars

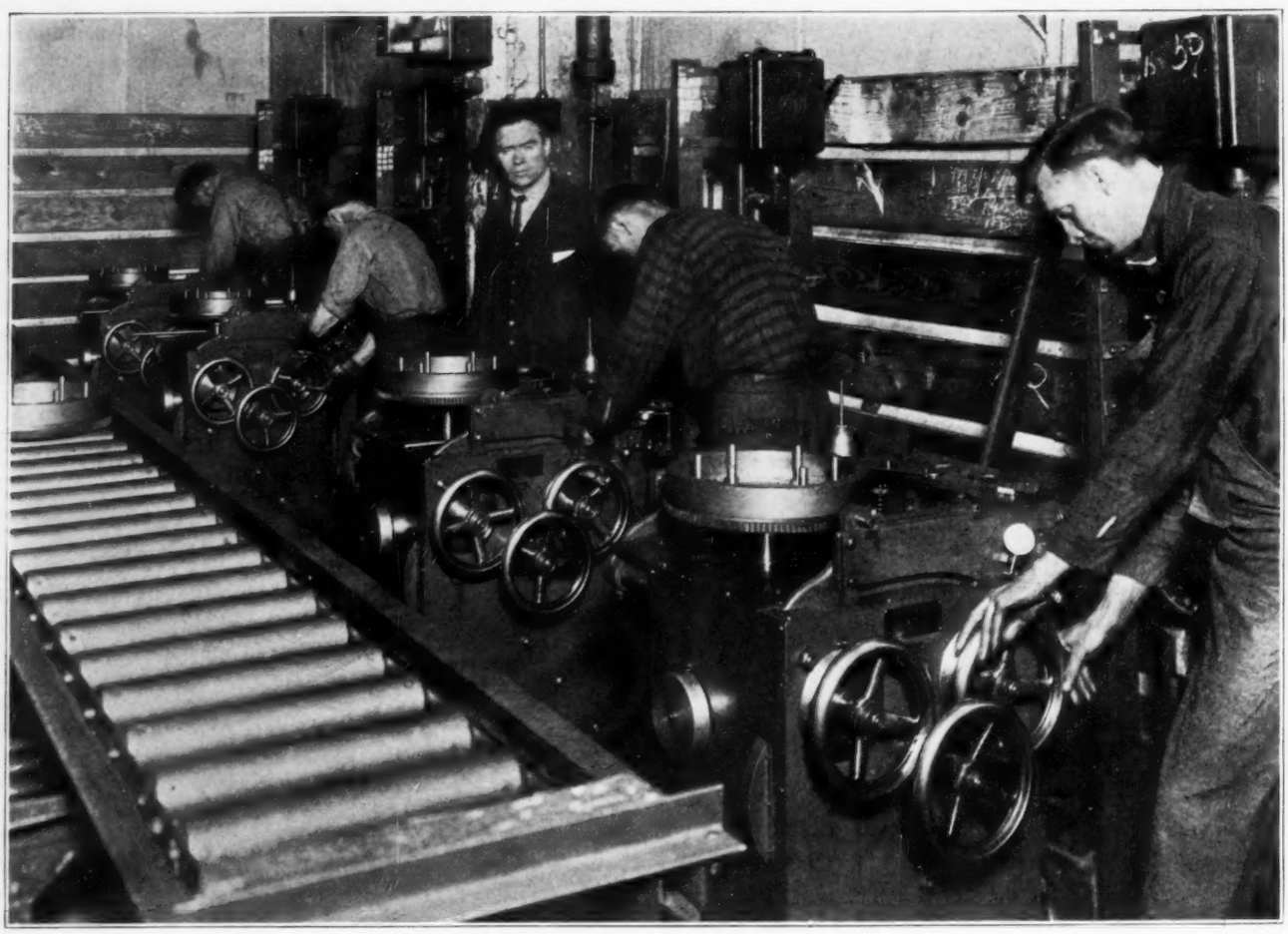
FLASH welding is being employed on a broader scale by manufacturers of automobiles in this country in the assembly of many of the parts. At the main plant of Dodge Brothers, Inc., Detroit, one of the purposes for which this method of welding is employed is for closing the gap in the starter gear blank. This particular part is made from a steel bar ⅝-inch thick, ¾-inch wide and 40⅝ inches long. The bars, purchased in multiple lengths, are cut to the desired length by a downcut shear and then fed into a set of bending rolls.

The bar is bent into an uncompleted circle by these rolls and then is transferred to a press equipped with dies which bring the two ends of the gear blank closer together and in alignment. The gap then is closed by welding. The machine employed for this purpose is equipped with copper jaws for holding the two ends in alignment during the welding operation. Current is brought to the machine at 440 volts and is stepped down to about 8 volts by a transformer house beneath the bed of the machine. The transformer circuit is closed by a switch of the trigger type located at the handle of a horizontal control lever. The latter, pulled through an arc of a circle, causes a system of toggles to force the ends of the blank together to form a complete circle.

Flash Is Trimmed

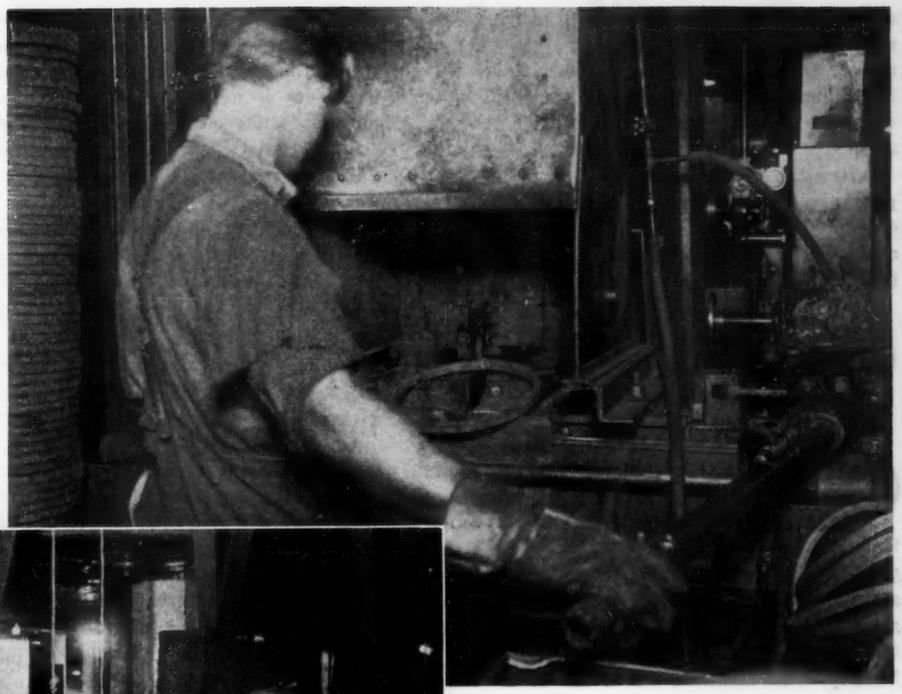
Any flash left at the joint as a result of metal being squeezed out by the upsetting operation is removed by a trimming press equipped with suitable dies. The blanks then are conveyed to an electric normalizing furnace into which they are charged in batches of eights. The furnace is controlled thermostatically, the temperature being maintained within a range of plus or minus 7½ degrees Fahr. of the desired normalizing temperature. Following the normalizing operation the blanks are quenched in a bath of oil maintained at a constant temperature and then expanded to a slightly larger diameter. Each piece then is straightened and chucked in a lathe. The outside diameter then is turned to specified dimension, both sides faced and chamfered, the inside bored to the proper diameter and the inside corner chamfered.

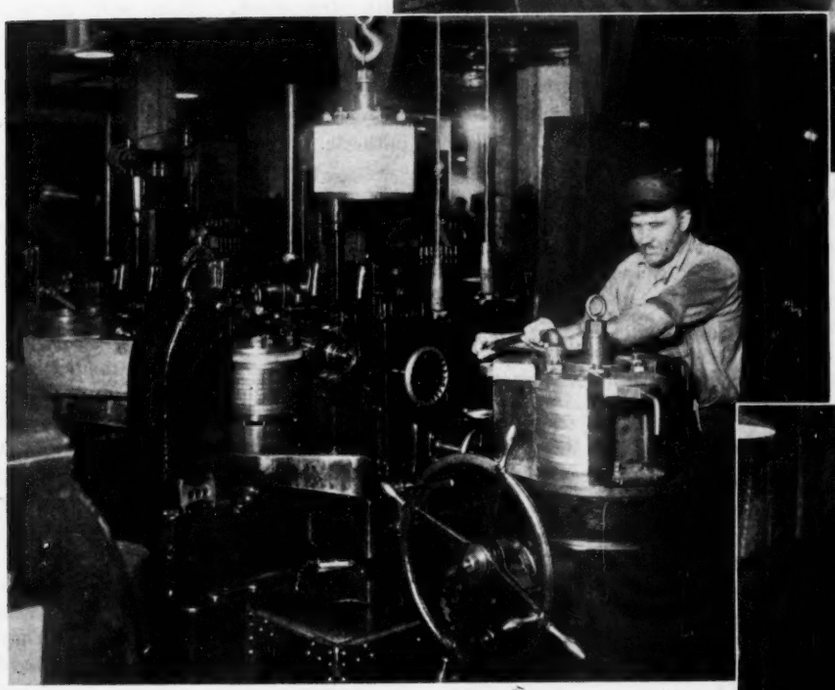
Blanks, which pass inspection, are arranged in stacks of 12, transferred by a monorail crane to a loading machine where they are lined up with relation to one another by three jigs or fixed chucks, and finally bolted together to preserve the alignment. The batch then is transferred by the monorail crane to a hobbing machine which cuts the teeth on the periphery. The cluster of blanks then is returned to the loading machine, the bolts loos-



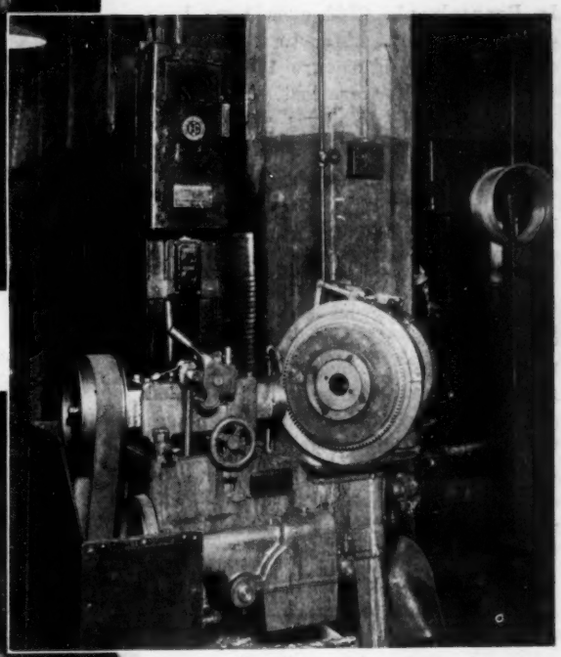
Battery of machines employed for testing the static and dynamic balance of the flywheel and starter gear assembly before it is bolted to the crankshaft

One of the machines employed for flash welding the starter gear blank is shown at the right. The flow of current to the welding jaws is controlled by a trigger switch mounted on the handle of the lever

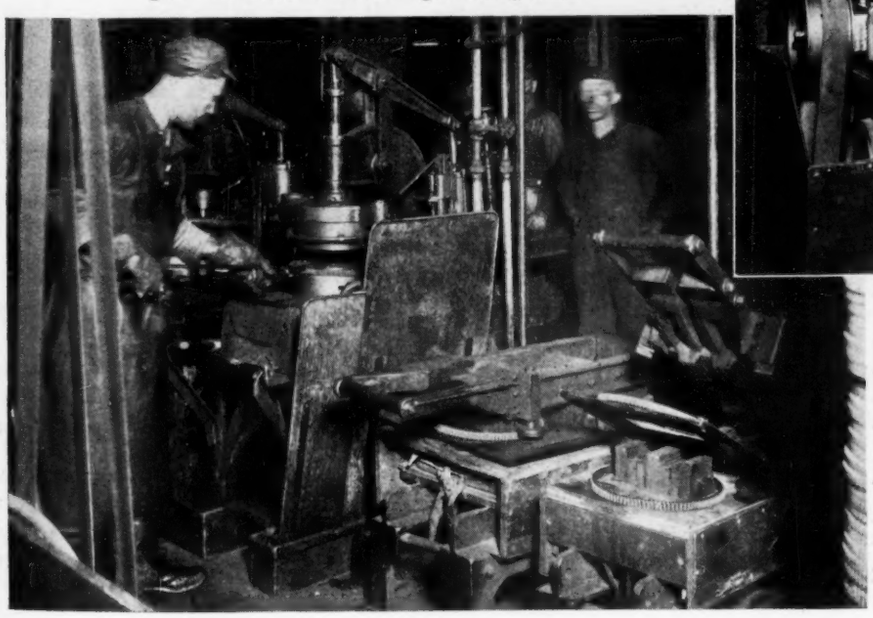




A cluster of 12 starter gear blanks being bolted together to preserve the alignment during the hobbing operation. A gear hobbing machine in operation is shown in the left background



Hydraulic press forcing a completed starter gear on the rim of a flywheel. Induction furnaces for heating the gear are shown in the right foreground



Machine which chamfers one corner of each tooth of the starter gear to facilitate meshing with the starter pinion

ened, and each piece handled separately through the remaining operations. One corner of each tooth then is chamfered to facilitate meshing with the starter pinion when placed in service.

After the removal of any burrs the gear is heat treated, quenched in oil and then conveyed through pickling and rinse tanks. At this point in the process the gears are tested for hardness by a soleroscope and the dimensions checked. Then follows the shrinking of the gear upon the flywheel. The gear is heated in an electric induction furnace to expand the steel to a slightly larger diameter and is transferred to a hydraulic press, registered on a flywheel and pressed upon the rim, contraction of the steel gear section facilitating a snug fit. The assembly then is placed in a machine designed to test the tightness of the fit. The bore for the flywheel flange then is sized, the assembly chucked in a lathe and a cut taken on the back face of the flywheel. The latter at the same time is faced for the clutch. The assembly finally is tested for static and dynamic balance and is ready for bolting to the crankshaft of a completed automobile engine.

Goggle Rule Should Be Mandatory

By Harry Guilbert

ONE of the most difficult phases of accident prevention is to persuade workmen to protect their most valuable asset, sight. Goggles are essential for humanitarian and economic reasons. The first needs no explanation. The second is answered by losses in the states of Pennsylvania and New York alone. How about the remaining 46 states? New York paid out in compensation $1,703,235.00 for eye accidents last year, and assuming that compensation payments to employes constituted only 20 per cent of the total cost of accidents to the employer, these accidents cost the state $8,516,175 in 12 months. In Pennsylvania 6842 eyes have been destroyed from 1916 to date. Included in this figure are 175 cases in which both eyes were lost. From Jan. 1, 1927 to date, 383 eyes were totally destroyed in various types of industry from coal mining to restaurants. In 1925 Pennsylvania paid out $886,599.00 in compensation alone. Conservatively speaking, this represents an economic loss of about $5,000,000.

There are goggles for every conceivable type of hazard, from hot metal to dust. The most expensive goggles are the cheapest. A good goggle lense should be strong enough to resist all ordinary impacts, have a clean surface, free from waves and scratches, be relatively free from prisms, and be relatively free from focus.

Strength is determined easily by drop tests which approximate the impact of a flying article. To give real protection a lense should stand a test of a ⅝-inch steel ball dropped at least 55 to 60 inches. Any test less than 40 inches can be met by ordinary crown optical glass unhardened. In any heavy impact goggle, an unhardened lense is valueless.

Surface is the most outstanding quality necessary in a good lense. A good surface determines the clarity of definition of objects viewed. Surface cannot be tested by a transit instrument which only shows up prismatic qualities of the lense. Tests for surface can best be made in a laboratory with scientific equipment. If you would test lenses yourself though for surface, hold the lense under a strong light and look at it from an angle, at least from 6 inches to 8 inches away, or better. Move the lense under the light so as to get the light rays striking the surface at different angles and you will readily pick out scratches, pits, grayness, waves, the real surface defects.

Example Should Be Set

To encourage men to wear goggles consistently it is absolutely essential that superintendents, managers, foremen and leaders set the example by protecting their sight. Imagine a chipper's reaction when his foreman, without goggles, stands in the danger zone and asks the workman why he is not wearing his! Goggles must be fitted correctly. No two noses are alike. Periodical adjustments must be made, daily if necessary. Give the safety inspector a pocket repair kit which will enable him to make adjustments and repairs right on the job.

The writer has handled over 1000 pairs of goggles, the lenses of which were completely shattered by flying objects, without injury to the wearer's eyes. He also has collected a number of goggles with the lenses completely obscured with hot metal, and while men were burned about the head and face, the eyes were saved from injury.

Some of the "alibies" given by workmen for not wearing goggles are as follows:

"They hurt my eyes. They give me a headache." Examination by an oculist will determine whether or not there is defective vision. If so, he should be provided with prescriptive lenses.

"They 'fog-up' and I can't see through them." Rub both sides of lenses with a piece of good soap, wipe with dry cloth. This will prevent fog accumulating on the lenses for several hours.

"They make me look funny." Better look funny with two eyes, than pathetic with one.

"Goggles are heavy." The fact is they weight about 1½ ounces, very little more than an ordinary pair of glasses. There is no comparison between the weight and the protection they offer.

"Why should I wear them? There are men in other departments who never wear goggles." Granted that a man chipping a casting is exposed to a greater hazard than a man at a wood machine. The fact remains that scores of men in wood working plants have lost eyes as a result of being struck by slivers of wood.

Artificial limbs made today are almost lifelike. Forty thousand glass eyes are imported each year. They are works of art and sometimes hard to distinguish from the real thing, but unfortunately the wearer cannot see through them.

It is the writer's firm conviction that the goal for which we are striving will never be attained until a mandatory ruling is issued to the effect that every employe in the shop must wear goggles while on duty. This rule is enforced in the shops of the Pullman Co. and is the reason why goggles are worn universally.

Abstract of address at joint meeting of National Committee for Prevention of Blindness and National Safety council, Chicago, Oct. 14. The author is director, bureau of safety and welfare, Pullman Co., Pullman, Ill.

Building Permits Increase

May building permits gained 4 per cent over April, according to reports of S. W. Straus & Co. based on returns from 562 cities and towns in the United States. The May increase followed drops of 4 per cent in March and 13 per cent in April. The 25 leading cities reported an increase of 16 per cent over April and 6 per cent over May, 1927.

Seventeen Industries Take First Step Toward Better Distribution

Joint Committee of Manufacturers and Jobbers Is Outcome of Distribution Conference Sponsored by Bolt, Nut and Rivet Industry

A MOVEMENT charged with broad opportunities for ultimately improving the methods of distributing certain manufactured steel products was launched at the Waldorf-Astoria hotel, New York, last Thursday and Friday, when 300 representatives of manufacturers, jobbers and mill supply houses met in a conference held under the auspices of the bolt, nut and rivet industry of the United States. Among those present were 28 of the 34 jobbers, chairmen comprising the distribution committee of the bolt, nut and rivet industry, leading warehouse and wholesale hardware executives, presidents and vice presidents of manufacturers of steel products handled largely through jobbers, a score or more officers of trade associations, and a number of steel producers.

The most definite accomplishment of the conference was the creation of machinery intended to facilitate the early adoption of the distribution plan of the bolt, nut and rivet industry or a modification of it by other groups of industry, including those engaged in the manufacture and distribution of horseshoes, nails, wire fence, hack saws and hand tools, cap and set screws, valves and packing, cordage, abrasives, chains, shovels, cold finished steel, etc. A committee of 17 manufacturers with Charles J. Graham as chairman, and a committee of 13 jobbers headed by R. H. Welton were named. The members of the manufacturers' committee are to consult with their respective industries and perfect a permanent organization, after which both committees will hold a conference in Washington for the purpose of inviting the co-operation of certain government bureaus in working out details of the plan.

The New York conference consisted of four sessions, a dinner meeting and two luncheons. The principal speakers were Charles M. Schwab, Magnus W. Alexander, Gilbert H. Montague, Charles J. Graham and James Francis Burke. Much of the time in all four sessions was devoted to discussion in which nearly half a hundred manufacturers and distributors participated.

Describes Plan That Helped Bolt Industry

MORE than 250 invited representatives were in their chairs Thursday morning when Charles J. Graham, president, Bolt, Nut and Rivet Manufacturers association opened the first session. Mr. Graham characterized the conference as "one of the most representative groups of business executives ever assembled for the discussion of one subject—that of sales and distribution." He briefly outlined the problems of the bolt, nut and rivet industry and described the methods employed to solve them.

Wins Back Lost Business

Referring to one of these problems, he said:

"We found many of the railroads and large industrials were manufacturing bolts and nuts, having been forced into it when they were unable to secure material during the war period, and in the 1920 boom.

"We organized a department, with an ex-railroad man at its head, to go to these various companies with the idea of showing them they could purchase their material cheaper than they could manufacture it. We have been successful in a great many cases, the New York Central; Buffalo, Rochester & Pittsburgh; Lackawanna; Burlington; and Missourj, Kansas & Texas, having entirely ceased the manufacture of this product. We hope very soon to have the same success with the Pennsylvania railroad.

"In the industrial field, the Standard Steel Car. Co., Pullman Car & Mfg. Co., and General American Car Co. are among the number which now are our customers, rather than our competitors. We hope, eventually, by this method, to get back into our industry between 100,000 and 200,000 tons of product per year, which will increase our operations and decrease our costs."

CHARLES J. GRAHAM,
Who said:

"Let us . . . create an era of christianized commercialism."

Speaking of the industry's distribution plan, the success of which led to the calling of the conference, Mr. Graham said:

"Our investigation as to the causes of the distributors' attitude showed that we were responsible for it. In our struggle to secure enough orders to run our plants to capacity, we had practically lost sight of the distributor. We had become his most aggressive competitor and were soliciting trade which by virture of his facilities and location he could handle in a much more satisfactory and economical way than we could.

"We decided to try an experiment in the Pittsburgh district. In consultation with one of our local jobbers there, we suggested he appoint a committee of distributors and we would appoint a committee of the local manufacturers to discuss a possible method.

"We wanted to determine who the large buyers of our product in that territory were, and requested the jobbers to furnish us a list of all of their customers in all lines, which they did. The list contained 29,000 names. Our

committee studied this list and found there were 11,000 bolt and nut buyers in the district, taking in a territory within a radius of 200 miles of Pittsburgh.

"Our committee studied this list of 11,000 accounts and finally selected 275 names on the list on which we made the start of our experiment.

This is the basis of our arrangement with the distributor: We say to him that owing to the fact that the soliciting and handling of what might be termed the smaller run of orders, is too expensive for us, that we as manufacturers will only solicit business from the 275 accounts in this territory and will do everything in our power to have the balance of the trade flow through its proper channel—in other words through the distributor.

"While we will not solicit trade, other than the companies listed, we cannot legally and do not refuse to sell to the trade not appearing on this list. However, should we receive inquiries or orders from such trade, we will sell or quote them whatever prices we see fit, but we give the jobber this assurance, that on such inquiries or orders, we will each determine for ourselves as to what the average jobbers' resale price is out of warehouse stocks in the territory, and will have regard for that situation.

"This proposition worked out so satisfactorily to both parties in the Pittsburgh district that we determined to make it nation-wide in its scope, and we carried it to every important distribution center in the United States.

"The bolt, nut and rivet industry now is actively soliciting only 2690 accounts in the entire country, including the distributors, and every bolt and nut manufacturer in the United States has a copy of this list, whether he is a member of our association or not, and naturally our competition is much more active on the desirable business than ever before.

"We do not have any price agreements. We meet almost every two weeks. We have worked under advice of counsel ever since our organization started and prices are never discussed, even on past transactions. We do not dictate or even suggest resale prices to the distributors, that being entirely within their province."

In conclusion Mr. Graham plead for higher standards of ethics in business. "What we need," he declared, "Is the same kind of education in business as we have had in our homes . . . namely that the greatest factor in our pursuit of health, happiness and contentment is unselfishness and consideration for others. Let us put our minds to a further study of the golden rule and its application to the ethics of business and create for our country . . . an era of what might be termed christianized commercialism."

Schwab Endorses Move for Better Distribution

SPEAKING in the optimistic vein for which he is widely known, Charles M. Schwab, chairman of the board, Bethlehem Steel Co., and president of the American Iron and Steel institute discussed with more than usual frankness some of the aspects of the problems confronted by the steel industry. His address was interspersed with typical Schwab jokes.

Economy in Production Was Aim

After paying a glowing tribute to Mr. Graham for his enthusiasm and tireless efforts in leading the bolt, nut and rivet industry, Mr. Schwab spoke of the earlier days in the steel industry and stated that in the 50 years during which he has been intimately associated with the production of steel, the efforts of all executives have been bent toward economizing in manufacture. Mr. Schwab stated that we have now reached the point where it is not profitable to strive to obtain further increases of 4 or 5 per cent in operating economy. To illustrate this point he declared that in the last four years the Bethlehem company had spent 80 million dollars in improving its facilities and actually had reduced the cost of product by $7 per ton. However the advantage of this saving has been lost because steel is now selling for $8 less per ton than it was before these improvements were made.

Mr. Schwab deplored the fact that the great steel industry with an investment ranging from 5 to 5½ billion dollars is unable to earn more than from 4 to 5 per cent. He stated that one way to solve the problem is to devote as much time and talent to distribution as have been devoted to operation during the past quarter century.

Mr. Schwab then repeated the suggestion which he had made previously at the spring meeting of the American Iron and Steel institute, namely that steps be taken to amend or modify the Sherman law to permit manufacturers to engage in legal methods of distribution. He also reiterated his statement that he preferred doing business under the supervision of proper government bureaus to engaging in the "free for all" struggle now existing.

CHARLES M. SCHWAB
Who said:

"I believe our customers are happiest when they know they are paying the same price as the other fellow."

Mr. Schwab was warm in his praise of the Graham plan of distribution and stated that he would personally endorse it and would use his influence to enlist the support of the American Iron and steel institute for it. He said he realizes that distribution is an extremely difficult problem and then drifted into a number of significant statements regarding the mechanics of selling.

Attacks Differential Prices

"I believe," declared Mr. Schwab, "that our customers are happiest when they know they are paying the same price as the other fellow." He declared he does not believe in the preferential treatment of customers and stated offhand that "the little fellow is entitled to better prices, if anyone."

In conclusion Mr. Schwab declared that politics is not a vital factor in business. The most important factors in his opinion are those which are created by the steel producers themselves.

Following the address by Mr. Schwab, George Puchta, president, Queen City Supply Co., Cincinnati, spoke on several phases of distribution problems and then suggested that the conference authorize the appointment of a committee of ten or more distributors and another committee of ten or more manufacturers for the purpose of cyrstallizing the thought of the conference and whipping it into shape for action that will lead to

(*Continued on Page* 55)

Iron and Steel Engineers See More Electrical Power Used

VAST researches are being employed in electrical developments for the iron and steel industry, it was pointed out at the twenty-fourth annual convention of the Association of Iron and Steel Electrical Engineers in session, June 25-28, in the Stevens hotel, Chicago. The fact that researches and development work are being carried on so extensively is resulting directly in the broad use of electricity in the industry, it was declared.

Technical sessions covered wide ranges of discussion, and were largely attended. The membership of the association was thoroughly represented at the sessions and at the exposition. All technical sessions were held in the exhibition hall. An informal reception was held in the Stevens ball room the first evening for the members and guests of the association. The annual reception and dinner dance was held on Thursday evening. At informal luncheons during the convention, J. B. Taylor, engineer, General Electric Co., Schenectady, N. Y., gave a demonstration of making sound visible and light audible, and J. L. McCoy, engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., demonstrated the Wensley automatic man. L. H. Burnett, vice president, Carnegie Steel Co., addressed one of the luncheons.

Motor Drive for Mills Rapidly Gains Favor

AT ONE of the technical sessions the electrical development committee pointed out some outstanding facts regarding electrical development in the iron and steel industry. The chairman, W. H. Burr, electrical superintendent, Lukens Steel Co., Coatesville, Pa., pointed out that in 1920 the electrical development committee reported 44 motors driving reversing mills and 113 mills of various types on which electric motors had been installed, making a total of 157 motors on main roll drives at that time. In January, this year, there were reported more than 1500 main roll drive motors in the United States and Canada.

During 1927, 122 main roll drive motors were purchased, ranging in size from 300 horsepower to 7000 horsepower. "A review of the main roll motor installations made in steel mills in 1927 shows that a large number were used to drive continuous strip mills and today this is one of the most active improvements under consideration by the steel trade generally," the report stated.

Individual Drive Favored

"The rolling of wide thin strip steel requires very highly powered mills and the tendency has been very decidedly toward individual drive for the various roll stands.

"High speed tandem and continuous mills require roll drive motors which have a minimum amount of speed regulation in order to insure successful operation of the mill. Direct-current motors are used almost without exception for mills of this class."

The report cited the placing in operation by the American Sheet & Tin Plate Co. of one of the heaviest power tandem hot strip mills in the country in the Chicago district; the construction now being accomplished for the American Rolling Mill Co. in the Cincinnati district of a hot strip mill; mills recently purchased for the Cleveland district including 11 main roll drive motors ranging in size from 400 to 1200 horsepower and a total of 6050 horsepower, continuous capacity for both mills; the recent purchase by the Illinois Steel Co. of a 6500 horsepower 0/60/140 revolutions per minute single-unit reversing mill motor for the electrification of an existing steam-engine drive mill; the installation in Youngstown, O., by the Carnegie Steel Co. of a 4000 horsepower, 450 revolutions per minute synchronous motor for driving a 24-inch continuous billet mill; the cold strip mill installation for the production of wide material for the American Rolling Mill Co. in the Cincinnati district; the strip mill recently placed in operation by the Weirton Steel Co., Weirton, W. Va., with 11 driving motors totaling 16,600 horsepower, and a number of others.

"The use of magnets for handling hot iron or steel has expanded considerably during the year and now includes quite a few installations using rectangular magnets for handling hot strip steel in rolls either sideways or on end," the report continues. "The process usually saves two or three men on each turn, saves a great deal of other space because the steel can be kept in regular piles going up as high as the crane will permit and increases the production of the mill by preventing blockades."

Roll Neck Bearings Discussed

One of the most interesting papers was on "Anti-Friction Bearings for Roll Necks," by J. H. Van Campen, chief engineer, E. W. Bliss Co., Salem, O. "During the past year a great amount of progress and a large number of applications have been made in applying antifriction bearings on the roll necks of rolling mills," said Mr. Van Campen.

"These antifriction bearing applications are covering almost all types of rolling mills, rolling nonferrous metals as well as steel. Some are more or less experimental, but the great majority are successfully performing the duty for which they were installed. There are four types of antifriction bearings used on roll necks, namely, ball, straight roller, taper roller and spherical roller. The success of roll neck antifriction bearings depends practically upon three factors: (1) The selection of the proper type and size of bearing; (2) the proper mounting of the bearing on the roll neck; (3) the lubrication of the bearing.

"In selecting the proper type and size of bearing one is controlled by

New Officers

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certain limits, such as space limitations, which determine the maximum outside diameter of the bearing, and keeping the neck stresses within permissible limits, determining the diameter of the bearing bore. This, together with the loads and speeds under which the bearing has to operate, are the controlling facts in selecting the proper type and size of bearing.

"After determining the type and size of antifriction bearing to be used on the roll neck under consideration, next comes the proper mounting of the bearing, which is of equal importance, as the selection of the proper type and size bearing alone does not necessarily mean that the installation shall be a successful one. The important factors to be considered are the machine tolerances or fit to be allowed between the outside diameter of the bearing and the bearing container, and also between the bearing bore and the roll neck, and the proper running clearance of the bearing, the conditions of service which determine the precaution to be taken in the proper sealing of the bearing from infiltration of foreign substances such as water, scale and dirt which tend to work in, and the maintenance of lubrication within the bearing. Also the mounting of the bearing should permit the greatest ease in removing the bearing from the roll neck when changing rolls.

"In the lubrication of antifriction bearings for roll necks, care should be taken in selecting the proper lubricant. The factors covering this selection are the speed under which the bearing operates, the temperature, and if rolling material wet or dry. Of the various types of mills the backed up type such as the cluster mill and the 4-high mill offer the best conditions for antifriction bearing applications, as the allowable space limits are greater than any other type of mill. Next comes the 2-high mill, and last the 3-high mill. The greatest percentage of antifriction bearing applications to date have been made on the backed up type of mills.

"On existing mills the problem of installing antifriction bearings offers greater difficulties than on new mills, as in new mills the design of the rolls and mill housings can be made to better accommodate the bearings.

Types of Bearings Used

"The following will illustrate various types of antifriction bearings, as applied to roll necks. Fig. 1 illustrates a typical mounting of a Norma-Hoffmann-type bearing, which consists of a double row roller bearing for use on the necks of backing up rolls. In this case two rows of straight rollers are employed with separate inner races, but with a common outer race. A double direction roller thrust bearing is used for the endwise location of the roll. This type of bearing employs short rollers in the radial bearing, as it is a known fact that the rollers have a tendency to become slightly out of parallel with the axis of the roll neck, and when such is the case there is a possibility of the end of the roller breaking off.

"Fig. 2 illustrates a typical mounting of an S. K. F.-type spherical bearing. Abroad this type of self-aligning spherical bearing has been used for several years for roll neck. The self-aligning feature of this bearing is very important when the bearing is subjected to heavy stresses caused by deflection of the roll neck. This mounting employs a ball bearing for the endwise location of the roll. The labyrinth enclosure or seals for this application are intended to offer a maximum amount of protection against the entrance of dirt and water.

"Fig. 3 illustrates a typical mounting of a rollway bearing, which consists of a straight roller radial bearing and a single acting roller thrust bearing for each end of the roll to locate the roll. The radial bearing on each neck is divided into two roller assemblies. This is done to insure greater accuracy.

"Fig. 4 illustrates a typical mounting of a Timken-type bearing which is of the taper roller type. This type of bearing is capable of taking both the radial and thrust load within itself, and is used with two or four rows of rollers, depending upon the load capacity required.

"In sealing antifriction bearings used on roll necks and where the speed conditions permit, the most effective method appears to be in applying grease which should be made from a good grade cylinder stock oil having a viscosity of 150 seconds at 100 degrees Fahr. Universal Saybolt, under a slight constant pressure. The amount of pressure applied should be so that there is a very small leakage of grease from the seals.

"Another important feature which is very essential to the success of antifriction bearings on roll necks, is the care used by mill crews when removing and replacing the bearings during roll changes. These bearings are a fine piece of mechanism and very expensive, and therefore no dirt should be allowed to get in the mountings when they are removed.

"There is no doubt that it would be well worth the time and expense of mill operators who are using antifriction bearings on their mills to

(*Continued on Page* 51)

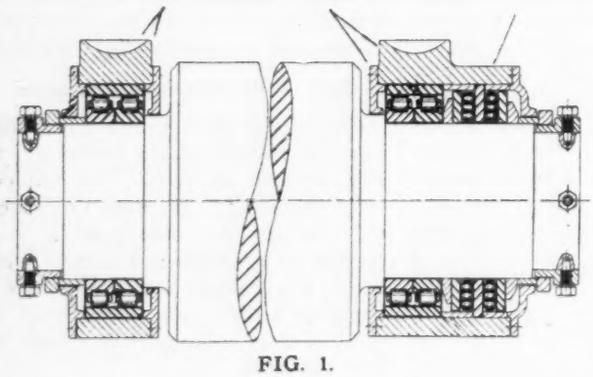

FIG. 1.

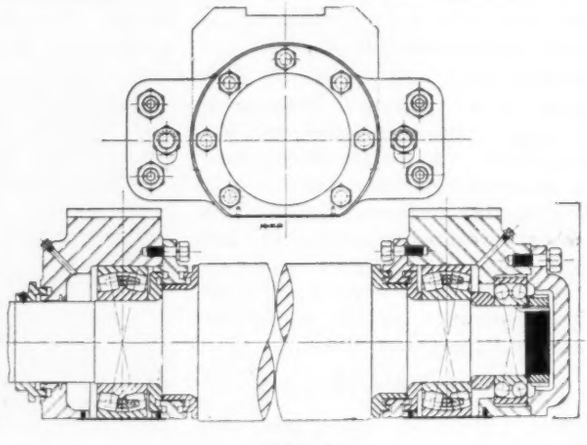

FIG. 2

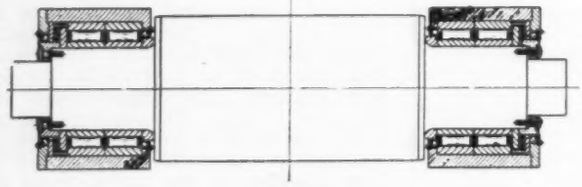

FIG. 3

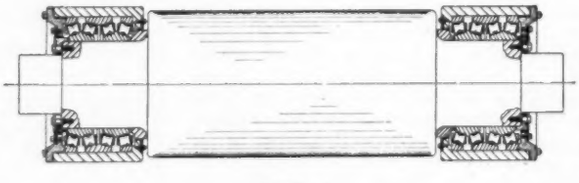

FIG. 4

Typical antifriction bearings for roll necks. Fig. 1 shows a double-row roller bearing for backing up rolls, Fig. 2 a self-aligning spherical bearing, Fig. 3 a straight roller radial bearing and a single acting roller thrust bearing, and Fig. 4 a taper-type roller bearing which takes up both radial and thrust load

A.S.T.M. Holds Annual Meeting

Nearly 1000 Members Participate in Numerous Committee Meetings and Technical Sessions in Atlantic City

New Officers Elected—Charles B. Dudley Medal Is Awarded to A. V. deForest for Magnetic Analysis Work

NOTABLE in many points, but more particularly in attendance, active interest and valuable accomplishments, the thirty-first annual meeting of the American Society for Testing Materials, held at Atlantic City, June 24-29, was exceptional. With approximately 1000 members present, committees were in session during practically every hour from Monday morning until Thursday night and Tuesday, Wednesday and Thursday each presented three sessions of prime importance to the metalworking branch of American industry.

Accomplishments of this society by no means are limited to the proposal, adjustment and adoption of specifications. Perhaps this represents the phases of its work most familiar to the producers and users of metals. Equal in every way to this important service is the thorough research, the months of patient, scientific investigation which back every important advance in the knowledge of strengths and service properties of materials.

This year marked many advances in the adaption of metals to high temperature and high pressure resistance conditions, in the knowledge of corrosion resistance, in methods of investigating metal magnetically by nondestructive tests, and in the static and fatigue properties of cast, rolled and forged metals under both the ferrous and nonferrous classifications. Wear resistance, long the subject of keen thought, and also much unorganized investigation, is in a fair way of being reduced to accurate and measurable knowledge, through simultaneous and independent lines of research, reported here.

Properties of structural steel, always a subject of major importance to the society were given unusual attention at the sessions this year. Reports were given of the results of tests of tension and compression specimens cut from different section of standard rolled shapes. These are designed to indicate the influence of the rolling and forming operations upon the inherent strengths of structural steel.

Society Finds No Lack of Work Worth Doing

VISUALIZING the American Society for Testing Materials as a great working technical body of which every member is an active power, President H. F. Moore, University of Illinois, Urbana, Ill., formally opened the meeting on Tuesday morning with a brief address. He stated the ambition of the executive officers was that every member should be a committee worker, since a large portion of the accomplishments is through committee work. He spoke of the balance between research and standardization, the main purposes of the organization and how well the interests of these branches are maintained. In his opinion the society can continue to work for the next 50 years and always find work well worth doing.

More Papers Are Presented

C. L. Warwick, secretary-treasurer, in reporting on the papers and publications of the society told of the increased activity which permitted this meeting to offer 47 papers as contrasted with 32 last year, with an increase also in the volume of committee reports representing definite accomplishments.

The report of the committee on the correlation of research, of which Prof. H. F. Moore is chairman, briefly sketched the various research projects which are being conducted under direction of, or jointly under the auspices of the society. These total 78 individual lines of research investigation. One of the most recent general investigations undertaken is the study of wear testing of metals, a problem which the report of this committee listed as second only in importance to the corrosion studies which have been going on for a number of years.

New Officers

AMERICAN SOCIETY FOR TESTING MATERIALS

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Chief chemist, National Lead Co., Brooklyn, N. Y.

Vice President

K. G. MACKENZIE
Consulting chemist, Texas Co., New York

Members of the Executive Committee

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Department of civil engineering, Rensselaer Polytechnic Institute, Troy, N. Y.

H. S. MATTIMORE
Engineer of materials, Pennsylvania State Highway department, Harrisburg, Pa.

P. D. MERICA
Director of research, International Nickel Co., New York

SAMUEL TOBIAS WAGNER
Consulting engineer, Reading Co., Philadelphia

The symposium of papers presented at the meeting Tuesday evening inaugurated the work of the society along wear test lines.

With President Moore presiding, the second session, devoted to wrought and cast iron, was called to order immediately following the formal opening meeting. H. W. Faus, engineer of tests, New York Central lines, New York, recommended revisions of the standard specifications for staybolt, engine bolt and extra-refined wrought iron bars, reducing the percentage of elongation on bars, ¾-inch or under, to 25 per cent. Further, the committee recommended for adoption proposed new tentative specifications for iron and steel chain covering manufacture, chemical properties, physical properties and tests and inspection.

Presents Pipe Report

A study of centrifugal pipe in comparison with sand-cast pipe, made by F. N. Menefee and A. E. White, both of the University of Michigan, Ann Arbor, Mich., at the instance of the city of Detroit, was read by Mr. Menefee. The conclusions of the paper held that with present practice and on a similar basis of cost no outstanding advantages were found for either class; but if the annealing practice followed in

the manufacture of centrifugal pipe were modified according to methods they offered the investigators would favor centrifugal pipe.

F. E. Richart, University of Illinois, joint author with Prof. A. N. Talbot of a paper presented last year on methods of testing pipe, raised the question as whether a tension test of a small specimen, such as Mr. Menefee had described, would give a true measure of the strength of the pipe under service, since in the latter case, failure would be experienced at the weakest point. Dr. Richard Moldenke, Watchung, N. J., sounded a warning against the high phosphorus content of some French pipe which he had examined and which showed brittleness. J. T. Mackenzie, American Cast Iron Pipe Co., Birmingham, Ala., expressed doubt as to whether the annealing followed as a part of the production of pipe cast in metal centrifugal molds relieved all internal strains. He emphasized the remarks on the danger of high phosphorus.

Following this paper T. H. Wiggin, New York, chairman of the sectional committee on cast iron pipe, working under the A. S. T. M., American Waterworks association and American Gas association, stated that investigations now are proceeding to determine properties and specifications of pipe. The first problem is to get a better basis for design of pipe, one of which will take into account the inert or trench pressure in addition to the hydrostatic and normal corrosion effects. The next is to define tests of pipe rather than tests of test bars. Finally, he stated that the industry needs to know exactly what constitutes the best resistance to corrosion, and whether the present cement lining or bituminous coatings are adequate.

R. S. MacPherran, Allis-Chalmers Mfg. Co., Milwaukee, chairman of committee A-3 on cast iron reported on a

G. W. THOMPSON
New president of the society

number of fundamental changes which were recommended and adopted. The specifications governing gray iron castings, cast iron soil pipe and fittings and high test cast iron all will be affected by contemplated revisions consisting of changes in the arbitration test bar and the tension test specimen. Members of the committee decided that the arbitration test bar for transverse testing does not give results which are representative of the varying sections encountered in iron castings. They recommended three distinct sizes, representing light, medium and heavy sections as being most desirable, since the present arbitration bar represents only the quality of metal in the ladle.

A tentative specification was proposed for an arbitration test bar and tension test specimen for cast iron. This provides a pattern which will give a diameter of 1.2 inches at the center. In announcing the retirement of Mr. MacPherran as chairman of this committee, E. J. Lowry, Detroit, introduced resolutions of appreciation which were adopted by unanimous vote. The new officers of the committee on cast iron, elected Monday night, are as follows: Hyman Bornstein, Deere & Co., Moline, Ill., chairman; E. J. Lowry, vice chairman; and Francis B. Coyle, International Nickel Co., New York, secretary.

J. B. Kommers, University of Wisconsin, Madison, Wis., in a paper on the static and fatigue properties of some cast irons, reviewed a series of tests on ten sets of 31 bars cast in the form of the A. S. T. M. arbitration bar. These were subjected to tension, compression, impact, transverse, hardness and fatigue conditions. The fatigue endurance limit is shown to be related to tensile strength, hardness and modulus of rupture, but no relation to chemical composition is established.

The effects of melting and pouring temperatures, alloy additions and cooling rates were suggested as further lines of investigation.

F. B. Riggan, Stockham Pipe & Fittings Co., Birmingham, Ala., presented a paper which he prepared in collaboration with Edwin K. Smith on the effect of sulphur on gray iron. This showed that the hardness and combined carbon increase with the rise in sulphur, that fluidity is unaffected, that shrinkage increases up to 0.2 per cent sulphur and then remains constant and that castings carrying sulphur up to 0.2 per cent are not machinable. Other elements in the tests were retained as nearly constant as possible and the manganese was given as 0.34 per cent. With an increase in manganese, the deleterious effects of sulphur decreased.

Seek Knowledge of Wear Resistance of Metals

TUESDAY night's session covered in an intensive manner a wide range of discussion on test methods, but dwelt with particular emphasis upon the need for a knowledge of how wear resistance of metals should be measured. The latter phase was covered by four papers prepared by H. J. French, bureau of standards, Washington; John Howe Hall, Taylor-Wharton Iron & Steel Co., High Bridge, N. J.; W. H. Parker, American Chain Co., Bridgeport, Conn.; and J. M. Blake, American Manganese Steel Co., Chicago Heights, Ill.

Mr. French presented an abstract of a more complete report published by the bureau, outlining the wearing and mechanical properties of railway bearing bronzes. Specimens were tested under rolling and sliding friction, with and without lubrication, and at atmospheric and elevated temperatures, as well as under tension, single blow impact and pounding. These tests attempted to approximate the conditions encountered by bearing bronzes under actual service conditions. The Amsler wear testing machine, involving the rotation of a disk of the bronze against the edge of a revolving disk of steel and with electrical means of increasing temperatures gave the results presented on wear resistance. The results were determined by loss of weight and by visual and microscopic examination of the bronze specimens. It was shown that wear tests at atmospheric temperatures will not determine the effects of alloys or variables of other nature encountered in manufacture, when the temperature of the tests is raised.

The investigator stated that variations in chemical composition produced changes in properties, but that the changes were not as pronounced within certain ranges as those produced by varying the method of casting.

Chill cast bronzes wore faster and had a lower impact breakage value than sand-cast bronzes, but showed better resistance to pounding and higher tensile strength at temperatures ranging from 70 to 600 degrees Fahr. In alloys with a constant ratio of copper to tin, increasing the lead produced improvement in wearing qualities, but the resistance to pounding, notch-toughness and tensile strength decreased. In alloys with a constant copper to lead ratio, increase in tin from 0.7 to 5 per cent decreased the values in the wear tests without lubricant but improved the general wearing properties. Further increase from 5 to 10 per cent in tin improved the tensile and resistance to pounding, but did not affect the wearing properties. With higher tin, a slight decrease was observed in the impact values.

The paper by Mr. Hall covered tests on 12 per cent manganese cast steel where service conditions were reproduced by making the test specimens the jaws of a rock crusher. This method gave the combined pounding and abrasion condition necessary to bring out the greatest resistance of this type of metal. Abrasion with cold working seems to be required in this case since abrasion alone, as in the case of the Amsler machine, rubbing the specimen on emery under constant pressure and ordinary grinding give but little better wear resisting results with 12 per cent manganese steel than with carbon steel. Manganese steel outwore plain carbon steel 10 to 1 on the rock crusher tests.

Wear tests designed to measure the resistance of tire chain were given by W. H. Parker. He described a machine in which a test specimen is held and revolved against the flat side of a revolving alundum wheel. The

P. D. MERICA
Member of executive committee

specimen makes one revolution to three revolutions of the grinding wheel and a constant pressure is maintained by a fixed weight acting through a lever.

Describes Special Machine

A special machine designed by F. A. Fahrenwald, was described by Mr. Blake. This machine is a grinding machine in which the abrasive, pressure, speed, time and moisture or other liquid content are under a constant control. With this machine, Mr. Blake stated a certain alloy of the American Manganese Steel Co. showed a figure of 31 and another 10 in comparison with 100 for commercially pure iron and 72 for white chilled iron.

In the discussion which followed this series of papers H. W. Gillet commented upon the dearth of agreed methods of measuring wear resistance in all cases and offered the comment that the methods given in each case were designed to bring out certain inherent qualities of the various metals tested. An interesting discussion of the three general methods of determining particle size was given by Lincoln T. Work, Columbia university, New York. These include sieve tests, elutriation, or flotation and microscopic measurement. These are applicable in varying degrees to measurement of fineness in cement and other powdered material and more recently to pulverized fuel, where the finely divided particles give up their energy in the furnace and the larger parts are carried out or drop through as unconsumed carbon. J. M. Lessells, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., proposed changes in the method of determining yield point in tension, supplementary to the drop in the beam indication.

F. S. Mapes, General Electric Co., Schenectady, N. Y., proposed a method of calibrating the Rockwell harness testing machine for accuracy of load applied. He suggests supporting a piece of bar steel, level, upon two knife edges, with a dial gage for deflections immediately beneath the loading nose of the hardness tester. The application of the load upon the bar steel gives a deflection in the bar which may be measured in terms of the known deflection for this particular loading. Checking extensometers by a calibration device through a lever actuated by a calibrated micrometer screw was proposed by R. L. Templin, Aluminum Co. of America, New Kensington, Pa., in an able paper which described the apparatus in detail. A new instrument for testing brittleness of materials, in this case brush holder springs for electrical machinery, was described by P. L. Irwin, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Propose Few Changes in Steel Specifications

FEW marked changes were suggested in the report of the committee on steel, submitted at the session Wednesday morning by J. B. Young, Reading Co., Reading, Pa. This committee recommended for publication standard specifications for structural steel for bridges and buildings containing a provision for copper, where required, as not less than 0.20 per cent. The standard specifications for billet-steel concrete bars defines the phosphorus content as not over 0.08 per cent, compared with the present limits of 0.10 per cent for bessemer and 0.05 for basic open-hearth billets of the class mentioned. The specifications for electric cast-steel anchor chains are completely revised and as passed for tentative adoption cover all cast steel to be used in the complete chains, including stud links, enlarged links, end links, swivels, shackles and pins. Proof loads are established running from 60,000 pounds for 1 inch, to 888,000 pounds for 4⅛ inch chain cable. New tentative specifications for black and hot-dipped, zinc-coated, steel pipe for ordinary uses and for iron and steel chain such as is used for slings, hoists, railway construction and marine service were adopted.

Dr. G. K. Burgess, bureau of standards, Washington, presented the report of the joint committee on the effects of phosphorus and sulphur. This committee, which started its work in 1919, is made up of representatives of the society, bureau of standards, war and navy departments, American Railway association, Society of Automotive Engineers, National Research council, American Foundrymen's association, Steel Founders Society of America, Association of American Steel Manufacturers, Society of Naval and Marine Architects and more recently, the Petroleum institute.

The work is in progress on the

effect of both residual and added sulphur or phosphorus. Reports have been given on rivet steel, tubes, plates and structural steel. Cast steel has been under investigation since 1927, using sand-cast test blocks, cast in open molds from normal acid open-hearth steel. These specimens are cast six on a gate, the bars measuring 1⅛ inch square and 12 inches long. They are cut from the gate by gas torch and sand blasted. Tests are being made in the annealed, normalized and normalized and drawn states, with various percentages of phosphorus.

Report on Investigation

The investigation of welded steel pipe, used in the oil industry is in its incipient stages. This material is rolled, annealed and quenched. M. O. Withey, University of Wisconsin, Madison, Wis. reported progress on the work of the committee investigating the yield point of structural steel. Some 600 specimens of two types, one round structural bars of uniform composition and the other various parts cut from structural shapes, are being tested at laboratories of the Bethlehem Steel Co., Illinois Steel Co., Rensselaer Polytechnic institute, and the University of Wisconsin. It has been found that increasing the speed of loading increases the yield point, at some times as much as 12 per cent, as shown by some tests on silicon steels. The variation is greater for the structural specimens than for the bars.

A paper by Mr. Withey gave more details on the test of specimens cut from different sections of structural steel shapes. These showed that the moduli of electricity of structural specimens were approximately the same in tension and compression and that the ultimate strengths were uniform regardless of whether the test pieces were cut from tension or compression members. However, the proportional limits exhibited differences. The variability in specimens from the toes and roots of channels showed the greatest difference in proportional limit, probably due to variations in mechanical work and temperature in rolling.

The report of the committee on heat treatment of iron and steel of which Prof. H. M. Boylston, Case School of Applied Science, Cleveland, is chairman, was read by John Howe Hall, Taylor-Wharton Iron and Steel Co., Highbridge, N. J. This report recommended the following terms: Full meaning as covering iron base alloys heated above the critical temperature range, holding above that range for a proper period and followed by a slow cooling through the range; process annealing to mean heat treating at a temperature below or close to the lower limit of the critical range with cooling as desired; patenting to mean heating above the critical range, followed by cooling below that range in molten lead maintained at a temperature of about 700 degrees Fahr.

N. B. Hoffman, Colonial Steel Co., Pittsburgh, in presenting the report of the committee on ferroalloys reported progress on methods of testing and analysis for ferrotungsten, ferrochromium and ferromolybdenum.

An interesting series of papers on magnetic properties and analysis, consisting of a report of the committee on magnetic properties given by Thomas Spooner, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., and by R. L. Sanford, bureau of standards, of the committee on magnetic analysis, was supplemented by a paper by W. B. Kouwenhoven and J. D. Tebo, Johns Hopkins university, Baltimore, and another by Haakon Styri, S. K. F. Industries Inc., Philadelphia.

Explains Magnetic Testing

Magnetic testing is a nondestructive method of testing materials which still is in the experimental stage since the announcement of the possibilities in 1918. Reports have been made from time to time, notably one by A. V. de Forest, research engineer, American Chain Co. Inc., Bridgeport, Conn., in 1927, for which he was awarded the Charles B. Dudley medal of the A. S. T. M. at the meeting Wednesday afternoon. The paper by Mr. Kouwenhoven and associate describes a new method of magnetic analysis by which the authors investigated the properties of high-speed tungsten steel bars by using two magnetomotive forces simultaneously, measuring the change in induction produced by the superimposed or incremental force in the specimen. By means of this test, it was stated, it is possible to distinguish between bars that have been correctly heat treated and those which have not. Similarly, the paper by Mr. Styri showed that while magnetic analysis will not show the endurance of the steel, it will show deviation from correct heat treatment practice,

Urging Wider Use of A. S. T. M. Specifications

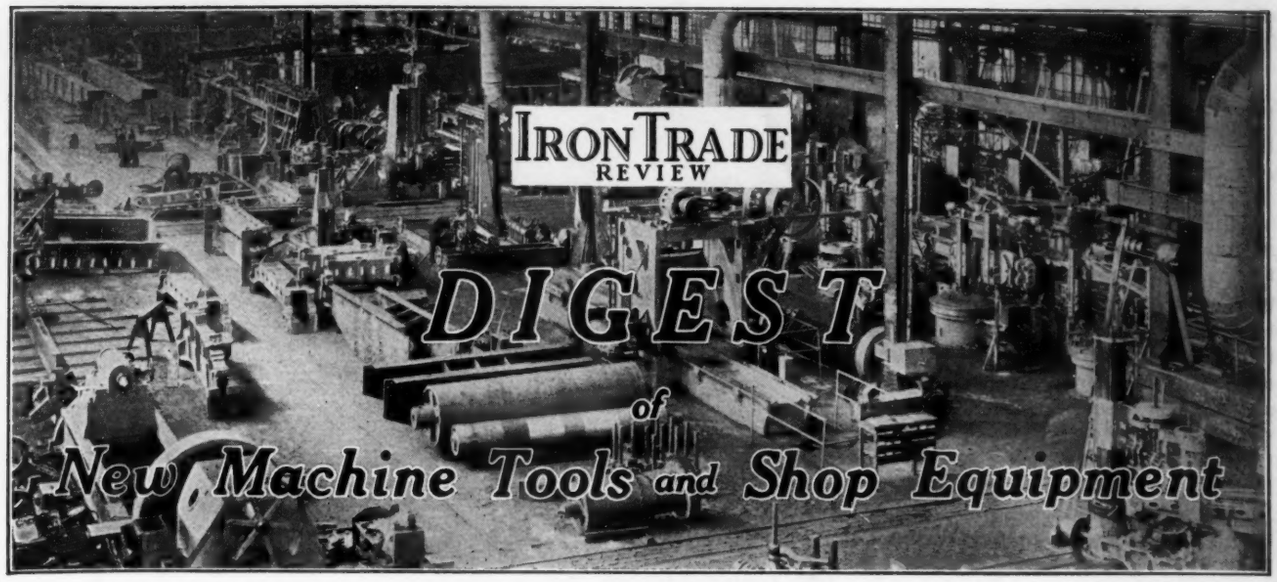
RECOGNITION of a distinguished service to the society and to the engineering world was carried in the award of the Charles B. Dudley medal to A. V. deForest, research engineer, American Chain Co., Bridgeport, Conn., on Wednesday afternoon. This award was based upon the work of Mr. deForest presented to the society through his paper, "A Method of Graphic Representation of Magnetic Characteristics," at the annual meeting in 1927. Mr. deForest, who was graduated from the Massachusetts Institute of Technology, Boston, in 1912, taught civil engineering at Princeton university for two years and took up his work with the American Chain Co. in 1918.

The third Edgar Marburg lecture was delivered by Dr. Frank B. Jewett, president and director of the Bell Telephone laboratories and a vice president of the American Telephone & Telegraph Co. His subject was, "Some Research Problems Involved in Transoceanic Telephony."

Unique is the term best applied to the annual presidential address of Dr. H. F. Moore at its session Wednesday night. Taking as his theme the life, work, influence and service of Robert Hooke, scientific investigator who lived and worked in the 17th century and whom he classed as the first mathematical elastician, Dr. Moore commemorated the 250th anniversary of the pronouncement of Hook's law. This law which states that the strain is directly proportional to the stress in elastic materials, was stated by the speaker to be the fundamental principle upon which every structural shape, casting, forging, arch or beam has been designed. While Dr. Moore stated his unwillingness to accept any statement of a physical law as an eternal verity, he holds that we are coming to regard these laws as simplified statements which give a useful workable basis for studying matter and energy.

C. L. Warwick, in presenting the annual report of the executive committee, reviewed the accomplishments of the society for the past year. Its membership has been extended, a new classification of company memberships and a new division of student membership have been set up. A new line of work tending to bring about

(*Continued on Page* 22)



First Half Tool Sales Show Gain

WITH the close of activities for the first half of 1928, we find that business in all metalworking lines was good and likewise in machinery and shop equipment. It follows, of course, that when the demand for metal products is high, manufacturers require additional or replacement equipment if orders are to be filled expeditiously and a fair profit is to be made. At this writing it is somewhat early to compare activity of this year with that of last, but from all indications it appears that sales of machine tools and shop equipment will show an excess of nearly 50 per cent over the sales volume in the corresponding period of last year.

A most hopeful and healthy situation is that much of the increase in business for the six months just closed came from general manufacturing lines rather than from relatively few specific industries. Automobile manufacturers purchased well during the early part of the year, but in the last three months have been taking only what was necessary to maintain operations. Notable exceptions to this have been purchases by Ford Motor Co. and Chrysler Corp., the former for Model A and the latter for the DeSota car soon to make its appearance. Automobile production in May was the highest for any May on record and but little short of the record of April, 1926. Due to the great expansion of the industry in the last few years, it was possible to reach this high point without purchasing much extra equipment.

The railroads had been considered a possible source for considerable business this year, but their aggregate purchases proved disappointing. A number of the carriers have participated in the buying, but individual lists have been small. The electrical industry has bought well and at the moment offers considerable promise

(*Concluded on Page 50*)

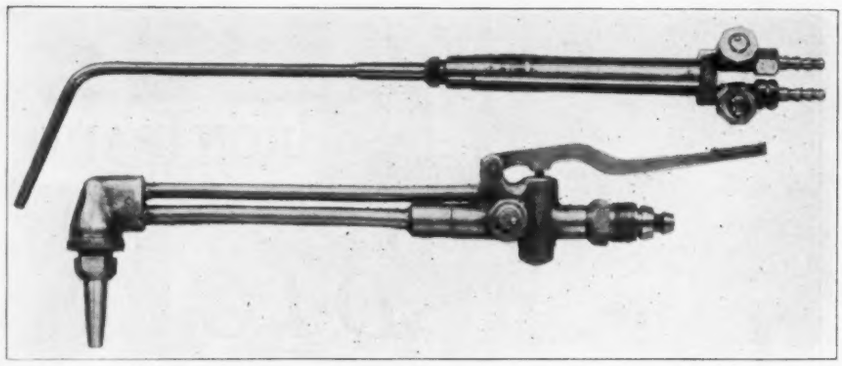
Iron Trade Review's Calendar of New Equipment

No.	Item	Builder	Comment	Date Described
137.	Tool holder and bits	O. K. Tool Co. Inc	Heavy-duty; for rough turning	June 7
138.	Drilling and tapping chuck	Apex Machine Co	Vertical float friction drive	June 7
139.	Grinding machine	Norton Co	For external, internal and face grinding	June 7
140.	Automatic screw machine	Davenport Machine Tool Co.	Adapted to new line of work	June 7
141.	Milling machine	Morton Mfg. Co.	For car journal bearings	June 7
142.	Draw-cut planer	Morton Mfg. Co.	Heavy-duty; 60-inch side feed	June 7
143.	Crane protective panels	General Electric Co.	Electrical controls smaller	June 7
144.	Master switch	Cutler-Hammer Mfg. Co.	For shipper rod operation	June 7
145.	Saw filing machines	Wardwell Mfg. Co.	For crosscut, rip and bandsaws	June 7
146.	Die stocks	Borden Co.	2-inch; self-contained; adjustable	June 7
147.	Pneumatic riveter	Hanna Engineering Works	For driving duralumin rivets	June 7
148.	Circuit breakers	Westinghouse Electric & Mfg. Co.	Mounted in steel structure	June 7
149.	Double radial drilling arm	Hisey-Wolfe Machine Co.	Supports portable drills up to 7/8-inch	June 21
150.	Sandblast tumbling barrel	American Foundry Equipment Co.	Combination machine featuring apron conveyor	June 21
151.	Molding machine	Badische Machine Works	Delivers sand by air pressure	June 21
152.	Motor-driven bench shear	Unishear Co. Inc.	Cuts up to 10-gage steel	June 21
153.	Oil tempering bath	General Electric Co.	Redesigned model; same size	June 21
154.	Nut driving machine	Procunier Safety Chuck Co.	Drive or removes nuts from threads	June 21
155.	Crane trolley	Morgan Engineering Co.	30-ton, worm-type; roller bearing	June 21
156.	Metal sawing machine	Cochrane-Bly Co.	Larger sizes; uses 42 or 48-inch saw	June 21
157.	Pneumatic press	Hanna Engineering Works	Weighs 95 pounds; exerts 8 tons	June 28
158.	Air compressor valve	Pennsylvania Pump & Compressor Co.	Simple construction; air cushioned	June 28
159.	Monorail track	Louden Machinery Co.	Special section; heavy carrying capacity	June 28
160.	Tractor mounted welder	Pontiac Tractor Co.	Available in several types	June 28
161.	Power sheet folder	Jarecki Machine & Tool Co.	Folds 16-gage stock; new design	June 28
162.	Ladle-nozzle	Joseph Dixon Crucible Co.	Half refractory clay, half graphite	June 28
163.	Welding and cutting torch	Air Reduction Sales Co.	Oxyacetylene; for general purpose	July 5
164.	Electric welding machine	Lincoln Electric Co.	300 amperes; gasoline engine driven	July 5
165.	Arc welding control equipment	General Electric Co.	Controls current in automatic heads	July 5
166.	Direct current generator	Buda Co.	Diesel engine drive; for crane operation	July 5
167.	Tractor swing crane	Frederic H. Poor Inc.	Gasoline driven; 10-foot radius	July 5
168.	Foundry cupola	Whiting Corp.	Fabricated from structural shapes; new design	July 5
169.	Paint spray gun	Alexander Milburn Co.	Accurate adjustment of spray possible	July 5
170.	Air compressor	Sullivan Machinery Co.	Motor driven; portable; compact	July 5

New Welding and Cutting Torch of Wide Range

No. 163

Air Reduction Sales Co., 342 Madison avenue, New York, is placing on the market a general-purpose welding torch designed for light, medium and heavy welding, covering the range from ⅛-inch sheet metal up to the heaviest sections. The new torch, shown in the accompanying illustration, has standard hose connections, also compact quick-opening and closing needle valves and one-piece tapered copper welding tips. Oxygen and acetylene, conveyed in separate seamless tubes through the handle, combine in a mixer head fixed to the front end by an annular nut. Two mixer heads cover the range of ten welding tips. The theoretical oxyacetylene ratio of one volume of oxygen to one of acetylene is said to be very nearly realized in this torch, the actual ratio being approximately 1.01 to 1. To make the torch complete for fabrication and welding, the cutting attachment shown in the lower part of the illustration has been designed to fit the head connection in place of the mixing head and welding tip. The torch then cuts and bevels pipe and all thicknesses of steel up to 6 inches; it is made with either 75 or 90-degree angle heads. The weight of the torch is 29 ounces.

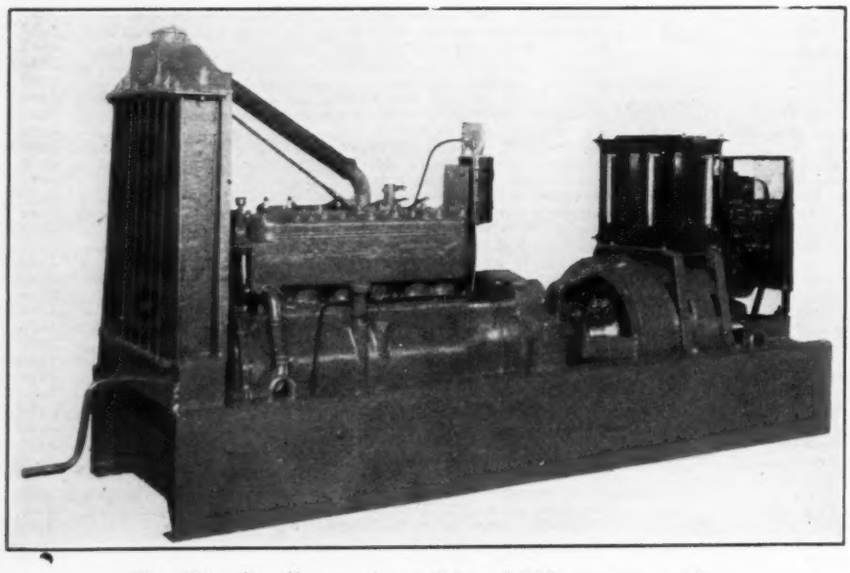


No. 163—Welding torch above and cutting torch below

Drives Electric Welder by Gasoline Engine

No. 164

Lincoln Electric Co., Cleveland, has placed on the market a new gasoline engine driven welder, the generator of which is rated at 300 amperes in accordance with N. E. M. A. standards and has a current range of from 75 to 400 amperes for metallic electrode welding. As shown in the accompanying illustration, the generator is connected to a 6-cylinder Buda-type engine operating at 1500 revolutions per minute. Both units are mounted on a welded steel base, thus giving maximum strength and rigidity with minimum weight. The engine has an S.A.E. rating of 27.3 horsepower and gives a brake horsepower of 41 while running at operating speed. It is said to be economical in gasoline consumption. The gas tank is located in the channel iron frame under the engine, thus eliminating fire hazard. The generator has the laminated magnetic circuit with separately excited field, stabilizer, variable voltage and steel construction features characteristic of the company's line. The overall dimensions are 93 inches long, 35 inches wide and an overall height of 45 inches. The equipment has been designed to meet the constantly increasing use of larger electrode in welding and the 6-cylinder performance of the gasoline engine driving medium gives a smooth even flow of power.



No. 164—Gasoline engine welder of 300 amperes rating

Control of Welding Arc Eliminates Craters

No. 165

General Electric Co., Schenectady, N. Y., has improved the control equipment used with its automatic arc welding heads so that the feed of electrode wire is stopped a short time before shutting off the welding current at the end of the weld. This serves two purposes; first, it clears the electrode from the weld, and second, it fills in the crater which is inevitably left at the end of the weld when the arc is cut off short. In operation, when the end of the weld is reached, the operator pushes the "stop" button which opens the auxiliary contactor. This in turn stops the electrode motor and opens the magnetic clutch circuit, thus stopping the wire feed. The line contactor remains closed for a short time because of the action of the time-delay. This allows the arc to burn back the electrode sufficiently to clear the weld and also fill the crater. The time-delay relay then opens and in turn opens the line contactor and stops the travel motor.

Generator Set Furnishes Direct Current

No. 166

Buda Co., Harvey, Ill., is building a diesel-engine electric generating set for supplying direct current for crane operation where direct current is not available. Direct-current motors afford high starting torque, close speed regulation and dynamic braking, all of which are important considerations in crane operation. The new generating set consists of a diesel engine direct-connected to a 65-kilowatt, 900 revolution per minute, 250-volt, 260-ampere, direct-current generator. The set is designed to provide continuous service and to withstand the wide variations in load without greatly affecting the voltage

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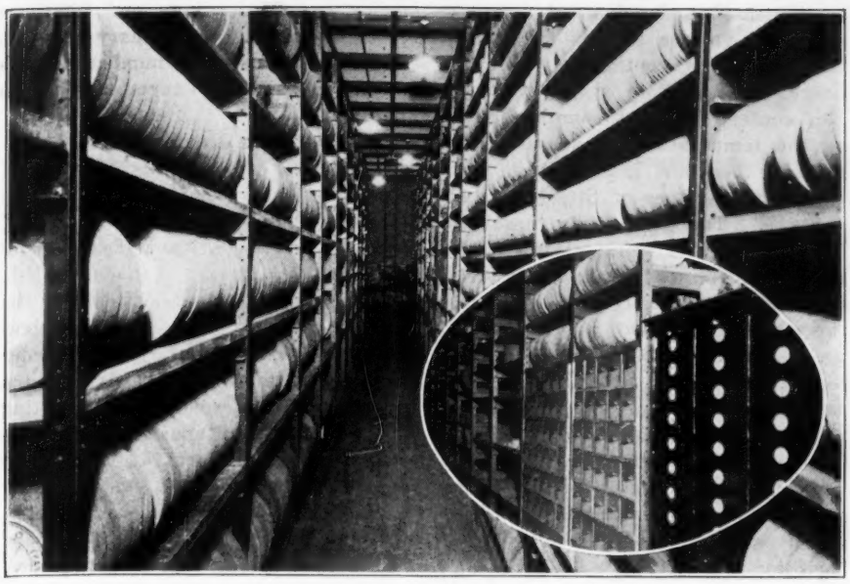


Steel and wood racks for grinding wheel storage

Employs Sectional Steel Racks for Storing Grinding Wheels

CONFRONTED with the problem of storing upward of 75,000 grinding wheels in a manner to be readily obtainable, the Strong, Carlisle & Hammond Co., Cleveland, distributor of abrasive grinding wheels, installed the rack shown in the accompanying illustrations which was designed by the company's abrasive engineers and built by the Van Dorn Iron Works Co., Cleveland. The design is exceedingly simple and it can be followed to advantage by any user or distributor of wheels.

The rack is made in sections, each unit being 8 feet long, 12 feet high and 20 inches deep. The material is 14 gage steel, while the corner angles are ⅛-inch material. The part of the rack nearest the wall is used for the storage of the heaviest wheels for here the rack receives the benefit of heavy sills under the floor. Both racks, however, are located on 4-foot centers so that the weight is taken by the floor timbers. As a further precaution the racks are suspended from the floor beams above. The load carried approximates 650 pounds to the square foot. Provision is made for storing 30 per cent more wheels than are in stock at present.

The wheels are set on wood shelves with a ¾-inch pitch toward the back. Thin wheels in elastic bond are stored flat. Attention was paid to the shelving on which these wheels are placed to make sure that it was planed flat and level. Otherwise the wheels might become warped in storage. An opening is left midway down the rack for unpacking, sorting, and packing wheels; small wheels are kept in cabinets shown in smaller illustration.

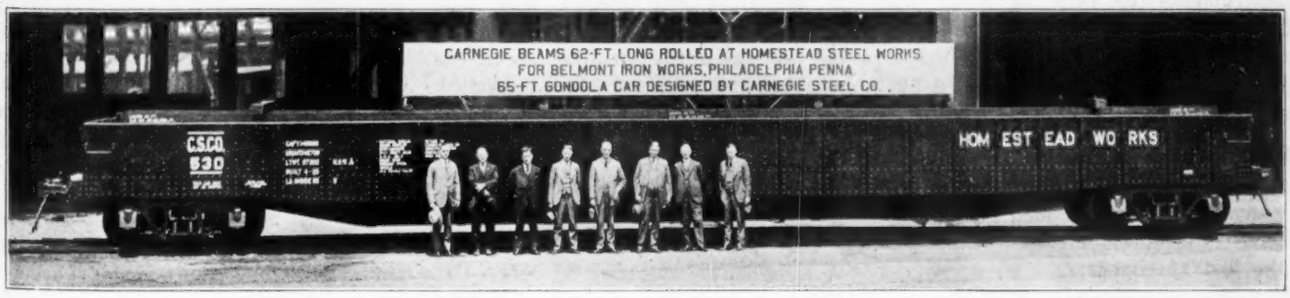
65-Foot Steel Gondola One of Largest Built

IN ONE of the long freight trains that rolled out of Pittsburgh to the East about three weeks ago there was one of the longest steel gondola cars ever built. This car was destined for the convention of the mechanical division of the American Railway association being held in Atlantic City during the following week. The car, which was the source of many questions and aroused considerable curiosity, was one designed by the Carnegie Steel Co. in connection with the erection of its new beam mills at Homestead, Pa. The Carnegie company has experimented with this type of car around its mills for the past three years, and recently has been engaged in experiments with the car on the trunk line railroads.

Car Is Exhibited

The car, which is shown in the accompanying illustration, is 65 feet long inside, as compared with an average length of 45 feet usually found in such type of car. In cooperation with the Master Car Builders and other railroad people, the new car was sent to the convention for observation and inspection by the interested railroad people. Leaving Pittsburgh, the car contained a load of beam sections for an eastern company, which was delivered after the convention closed. When loaded the car will carry 70 tons.

Among advantages which it is said will accrue from a car of this type are the saving of one car in shipping long pieces of shafting, pipe, poles, beams and other steel sections; instead of using two of the shorter cars the one 65-foot car serves the purpose in most cases; it tends to shorten train lengths without decreasing tonnages and it conserves terminal facilities and track room.


CARNEGIE BEAMS 62-FT. LONG ROLLED AT HOMESTEAD STEEL WORKS
FOR BELMONT IRON WORKS, PHILADELPHIA PENNA.
65-FT. GONDOLA CAR DESIGNED BY CARNEGIE STEEL CO.
CSCO
630
HOM EST EAD WO RKS

This unusually long gondola car was designed by the Carnegie Steel Co. in connection with the erection of its new beam mills at Homestead, Pa. Standing in front of the car from left to right are R. L. Twitchell, advertising manager; George Hager, chief shipper; K. Lean, superintendent of shipping; W. J. O'Neil, chief loader; R. H. Watson, general superintendent; L. C. Bihler, assistant to president; W. S. Guy, traffic manager; and J. W. Hoover, chief traffic dispatcher

Urges More Extended Use of Specifications

(*Continued from Page* 18)

a wider use of specifications as a basis of market quotation has been inaugurated with the formation of a committee of producers, users and representatives of the business press to study the promotion of the use of specifications in buying copper alloys in the ingot form. A new standing committee on fatigue of nonferrous metals and alloys and one on iron-chromium-nickel alloys have been established. A complete and comprehensive index of all standards and tentative standards, which number about 550 is under consideration. Work in promotion of international co-operation on specifications has been undertaken, with the active participation of the A. S. T. M.

Stiffer service conditions constantly are placing new requirements upon manufacturers of engineering materials and particularly upon fabricators of metal products. In recent years, the conditions of increased stress under higher temperatures encountered in the oil industry and in steam engineering practice have induced keen study of the properties of metals under advanced temperatures.

Experiments Are Described

Three papers at the morning session, Thursday, took cognizance of this major topic. The first covering *long-time* or *flow* tests of carbon steel at various temperatures was prepared by J. J. Kanter and L. W. Spring, Crane Co., Chicago, and was presented by the first named collaborator. A series of experiments conducted on cast steel ranging from, 0.23 to 0.40 carbon and rolled or forged steel rod, was performed upon a special apparatus designed for the tests. Standard, tension-type, test pieces with a uniform minimum diameter of 0.505 inches were held within a gap wound furnace capable of developing up to 1400 degrees Fahr. Instruments to each of these furnaces, provided with pyrometer connection and control and recording devices, gave constant information upon the temperature range. The test pieces were held in screw grips, with a lever system of loading. A system of optical measurement readable to 0.00005-inch in the 2-inch gage length gave information on the variation in the test specimens.

Tests were conducted at temperatures ranging up to 1200 degrees Fahr. and at various loadings depending upon the tensile properties of the material. They were subjected to the load and advanced temperatures for various periods ranging up to six months continuously or 4226 hours. The authors stated that carbon content in steel counts for less as the temperature rises and so far as inhibiting flow is concerned, small grain size becomes of little or no advantage. The comforting assurance is given that to bring about rupture in a short period of time the stress would have to be increased to near the short-time yield point. Higher pressures have comparatively less effect than higher stresses, and accordingly they urge heavy enough equipment, the avoidance of thin walls in pipes, valves, fittings and pressure vessels, both by reason of the resistance to long time flow and also to guard against the weakening effect of corrosion.

Value Is Questioned

In the discussion which followed, H. J. French, bureau of standards, Washington, questioned the value of general conclusions to be drawn from a narrow range of steel specimens due to encountering variables other than those which were being studied. R. L. Duff, Standard Oil Co. of New Jersey, Elizabeth, N. J., stated that although the deformation due to flow was small, much equipment would not permit such condition. He recommended short time tests at higher stresses, to find out the effect of sudden increases of pressure at higher temperatures. He also expressed the opinion that instead of a uniform change in shape or flow, a series of movements was responsible for the total changes reported.

The second paper in the series also covered the testing of materials at elevated temperatures recommending lines of investigation to be followed. This was presented by the author, P. G. McVetty, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. In view of the variations to be expected in commercial materials, he suggested that tests should be made on selected specimens, in which the uniformity in manufacturing method was held as closely as possible to a standard, but in which the weakest specimens at high temperature were studied. Slow heating of the specimen in the testing machine is recommended as desirable. The writer urges hardness and magnetic tests to attain uniformity.

The third paper by N. L. Mochel, Westinghouse Electric & Mfg. Co., had to do with the sticking or seizing of metals at higher temperatures. An apparatus was designed to rotate the flat surfaces of two metals in contact with each other without lubrication under various loadings and temperature conditions. Preliminary tests at 750 degrees, using a number of different metals are reported in the paper.

Another main division of the Thursday morning session was the consideration of corrosion and corrosion fatigue. The first paper by D. J. McAdam Jr., U. S. Naval Engineering Experiment station, Annapolis, Md., reviewed previous publications on the subject and reported the investigations of carbon and alloy steels under various kinds of water, where the corrosion effect was prior to testing or induced simultaneously with the stressing. The effects of time, number of cycles of stress, and diameter or thickness of specimen are studied.

F. N. Speller, National Tube Co., Pittsburgh, presented a paper prepared jointly with I. B. McCorkle and P. F. Mumma of the same company, covering the effect of corrosion accelerators and inhibitors on fatigue of ferrous metals. It was found that sufficient inhibitor, in this case sodium dichromate, to stop corrosion in the presence of fatigue prevented the reduction of the ordinary air fatigue endurance limit, when the metal is subjected to cyclic stress and ordinary corrosion. External factors which localize corrosion effect determine the point of failure, and this can be neutralized to a certain extent by the use of proper inhibitors. These findings point to the need for a protective coating that will not break down under cyclic stresses.

Progress Is Reported

The committee on the corrosion of iron and steel reported progress results on the long time tests being conducted on various materials in different sections of the country. At Fort Sheridan, Ill., construction of new buildings made necessary the conclusion of the tests on open-hearth and pure iron sheets. Noncopper bearing groups have been showing failures in substantial numbers since the end of the first 37 months of the test. Failures in the copper bearing groups have taken place after 126 and 132 months. The committee by resolution reaffirmed its stand that results of so-called acid corrosion tests are unreliable. In conclusion the statement was made that copper-bearing metal shows marked superiority in rust resisting qualities to non-copper-bearing metal of the same general composition under atmospheric exposure.

F. N. Speller, reporting as chairman of the subcommittee on total immersion tests reported progress on

(*Concluded on Page* 50)

Editorials

"Happiest When Paying Same Price"

MUCH satisfaction can be derived from the distribution conference held last week in New York under the auspices of the bolt, nut and rivet industry. The attendance alone, embracing as it did representatives of producers, manufacturers, distributors, trade association executives and attorneys from practically every industrial center of the United States, indicated a gratifying degree of interest in the subject of distribution.

The immediate result of the conference is that 17 industrial groups will attempt to adopt the Graham plan or some modification of it. These groups manufacture and distribute steel products handled largely through jobbers and mill supply houses. The Graham plan attempts to substitute co-operation between manufacturer and distributor for the competition which ordinarily prevails between these two agencies. While in the long run some of the details of the plan may not prove desirable, there can be no question but what the motives behind it are sound and it should be supported if for no other reason than that it promotes better relations between manufacturer and distributor. It is noteworthy that little heavy steel is sold through jobbers.

From the standpoint of steel production, the most significant part of the conference was the statement by Mr. Schwab: "I believe that our customers are happiest when they know they are paying the same price as the other fellow." This brief sentence, acknowledging as it does the desirability of a one-price policy and condemning preferential treatment of customers, might easily be taken as the text for a movement that would revolutionize the present complicated machinery of quoting and selling steel.

If the steel industry overnight could be reorganized to accord with the spirit of this offhand statement by Mr. Schwab, many of its major problems would be solved forever.

Seek Buried Facts on Corrosion

CORROSION, the arch enemy of metals, is being hunted to its lair with the idea of limiting its ravages. Much progress has been made along many lines, by improvement of the metals to make them resist destruction and by protective coatings.

A campaign now is being waged to determine what can be done for metals whose use places them below ground and subjects them to the action of chemical constituents of the soil. Acid and alkaline soil have varying effects on various metals. It is desired to establish actual facts as to these effects and make it possible to determine in advance what sort of pipe will resist the action of soil and soil water on it in a given situation.

The bureau of standards has buried about 14,000 specimens of pipe materials, fittings and protective coatings in 47 different soils. The experiment will be concluded in 1932, ten years after its commencement. A preliminary report has been made, based on 2000 specimens. Several corrosive soils have been discovered but their extent has not been determined. This is a matter for future investigation.

Results at this time are negative. No one commonly used type of ferrous pipe material at present appears superior to all others under all soil conditions. Some nonferrous materials satisfactory in some soils are not so satisfactory in others. Galvanized steel lasts longer than ungalvanized in acid clay soils but strongly alkaline soils attack zinc rapidly.

A successful method of laboratory determination of the corrosiveness of soil has not yet been found, but the effort is aimed strongly in that direction as further understanding of the process of corrosion is developed.

No "Tariff Loot" in Pig Iron

THIS publication is nonpartisan and is convinced that the iron and steel industry has worries enough of its own—more worries, certainly, than the average farmer—without getting into politics, but one indictment levied by the so-called keynoter at the Democratic national convention at Houston, Tex., June 26, calls for refutation. The goad is that "the head of the state increased the tariff loot of the pig iron industry by 50 per cent."

The President did raise the duty on pig iron 37½ cents per ton, on recommendation of the federal tariff commission, but ninety-nine out of every one hundred producers or consumers of pig iron never hear of or discuss the tariff. In the first five months of 1928 the United States imported 63,496 tons of pig iron, or exactly 0.00411 per cent of the 15,420,144 tons produced domestically. If there be any "loot" in in-

creasing the duty on four one-thousandths of the country's supply of pig iron 37½ cents per ton, then let the most be made of it.

A duty of $1.12½ per ton on pig iron even at present low prices is relatively less than a duty of 30 cents per bushel on wheat, 15 cents per bushel on rye, 8 cents per pound on cheese, 3 cents per pound on honey, 8 cents per dozen on eggs, or 33 cents per pound and 20 per cent ad valorem on wool.

The fact is, iron and steel has as much justification for demanding legislative relief as has agriculture. Considering the investment in research and methods as well as money, the average iron and steel stockholder receives a smaller return than the average farmer. It is a coincidence that the federal bureau of agriculture economics reports that the farm price index for May 15 reached 148 per cent over the prewar level, the highest point since August, 1925, and making it the best May since 1920. Last week the IRON TRADE REVIEW composite of fourteen leading iron and steel products, a comparable index, fell to the lowest point since April, 1922, and the average for May was the lowest for that month since 1915.

Picture the reception of the iron and steel industry at the hands of a Republican, let alone a Democratic congress, supplicating for a relief measure with an equalization fee!

Index Reveals Buyers' Dominance

WHEN the IRON TRADE REVIEW composite of fourteen leading iron and steel products retreated last week to $35.05 this sensitive barometer of iron and steel prices went to its lowest level since the week of April 19, 1922.

Beginning the first week of this January the composite rose from $35.07 to the year's high of $35.91 in the first two weeks of March. With a few minor exceptions, the decline since has been constant and the index has been accurately signalling that this is a buyers' market.

Except the last two months of 1921 and the first four months of 1922, buyers have not been so dominant since late 1915. In fifteen years the composite reached its lowest with an average of $21.58 for December, 1914. It is doubtful, however, that if labor, raw materials and freight be considered, $35.05 represents as remunerative a condition for producers today as $21.58 did in the prewar days.

The all-time high attained by this composite was $89.69, the average for August, 1917, just before government price fixing headed off a runaway market situation. In the balmy days of 1920 the peak was $68.87, the average for August of that year. In 1923, the first good production year after the shakeout of 1921, the peak was $47.52, and in 1926, in many ways a record output year, the top was $39.17.

Since 1923 the price trend in iron and steel, as mirrored by this composite figure, has been steadily sinking. At this time, with the midsummer lull in the offing, nothing that will arrest the downtrend is visible.

What Our Readers Are Thinking

Bullet Speed Versus Air Speed

To the Editor:

The writer notes in the IRON TRADE REVIEW of June 21, 1928, "The Age of Speed and Metallurgy" in the editorial column.

I believe that there is some mistake in stating that the airplane at 322 miles per hour would gain over a rifle bullet. The average velocity of a rifle bullet, as per various authorities, is not 398 feet per second, but is around 2000 feet per second. Computed to miles per minute would be 20 miles, or 1200 miles per hour. In other words, going a little further, the average velocity of modern guns range from 1500 to 3000 feet per second, and a rifle shoots a bullet only one-third of an inch in diameter at 2000 feet per second. This bullet travels so fast that it becomes hot to the touch, due to the resistance of the air, which it pushes aside.

Collier's New Encyclopedia shows that the velocity on the larger guns on the CRUISER NEW YORK is 2100 feet per second, and if it is true that the bullet traveling at that speed gets hot going through the air—when we reach the same speed by airplane, the writer just wonders how we will be able to keep the same cool enough, especially the highly volatile compound or fuel used to drive the engines.

G. B. N.

Cleveland, June 23, 1928.

EDITOR'S NOTE.—The comprisons between rifle bullet and airplane speeds were made by Lieut. Col. Norvelle W. Sharpe of St. Louis in an article appearing in *The Infantry Magazine* and later in *The Literary Digest* of June 9. Apparently both the army officer and the writer of the above communication are correct, for the former was considering average bullet speeds over maximum flights, while the latter was referring to initial velocity. Although initial or muzzle velocity may be many times greater than the speed of the fastest moving airplane, the bullet loses speed rapidly as the energy is expended. The following paragraph quoted from Lieut. Col. Sharpe will explain his deductions:

"It would hardly seem to be necessary to remind ourselves that these rifle bullet speeds are the average attained over maximum flights; nor yet that the speed of the initial half of the maximum bullet range will far exceed the plane speed; but as the rifle will not invariably be required to register on a plane within its initial 1000 yards, it is highly questionable whether at ranges appreciably greater than this it may be held to be dependably effective, especially when the target is either quartering, diving, receding, or in acrobatics."

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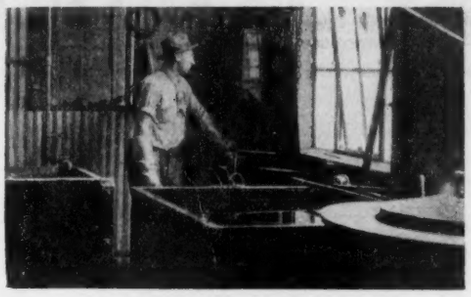

Wide Variety of Parts Made by Die Casting. Page 1.

A SIGNIFICANT movement looking to the solution of manufacturers' distribution problems was begun in New York last week, and a complete report of its important features is presented in this issue, beginning on page 11. The conference under the auspices of the bolt, nut and rivet industry brought together 300 representatives of manufacturers, jobbers and mill supply houses, and it is likely that the steel industry itself will be more broadly interested in the movement as it proceeds. A joint committee of manufacturers and jobbers indicates that co-operative action will be given a fair trial.

The Readers' Page

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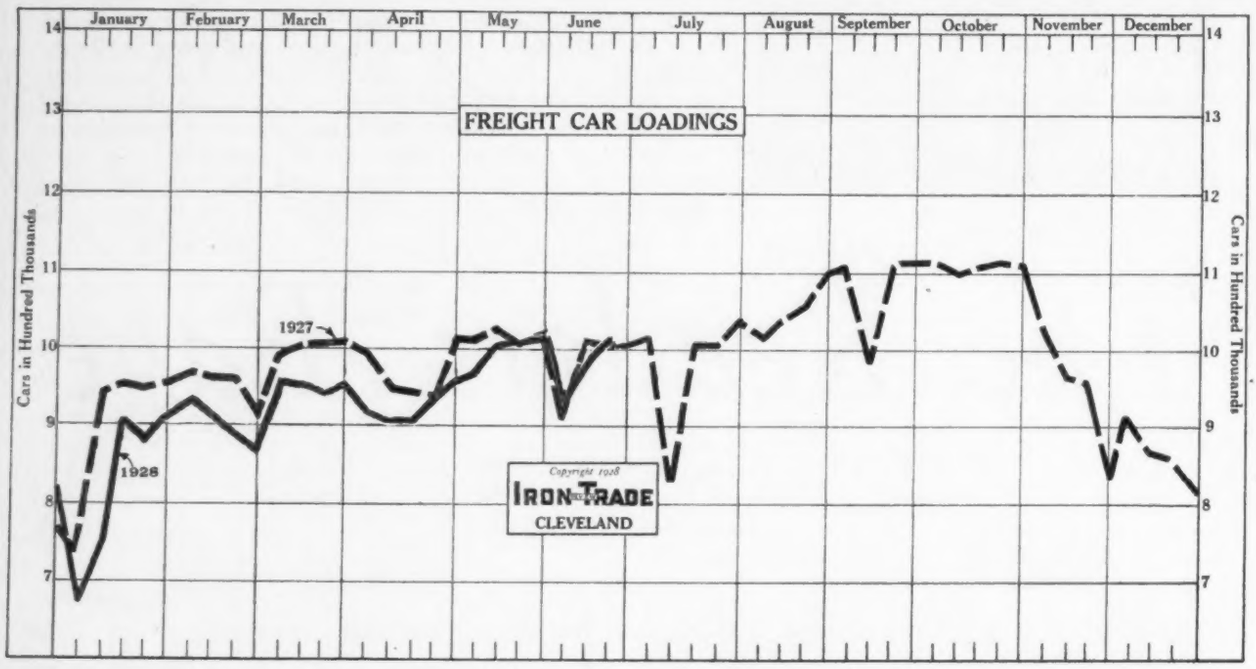
The Business Trend



Upward Turn For Trade Seen in Last Half

By JOHN W. HILL, Financial Editor

ALTHOUGH industrial activities apparently have passed their seasonal peak in many lines, the distribution and consumption of goods are continuing healthy expansion. This is indicated by the record of freight traffic. For the week ended June 16, freight movements totaled 1,003,300 cars. This was the fourth week of the year in which loadings exceeded the 1,000,000-car mark.

CAR loadings have been increasing steadily during the last few weeks. They still are running somewhat below the level of one year ago, but the margin has grown narrow. Since the first of the year traffic has declined from the totals of one year ago by 4.4 per cent.

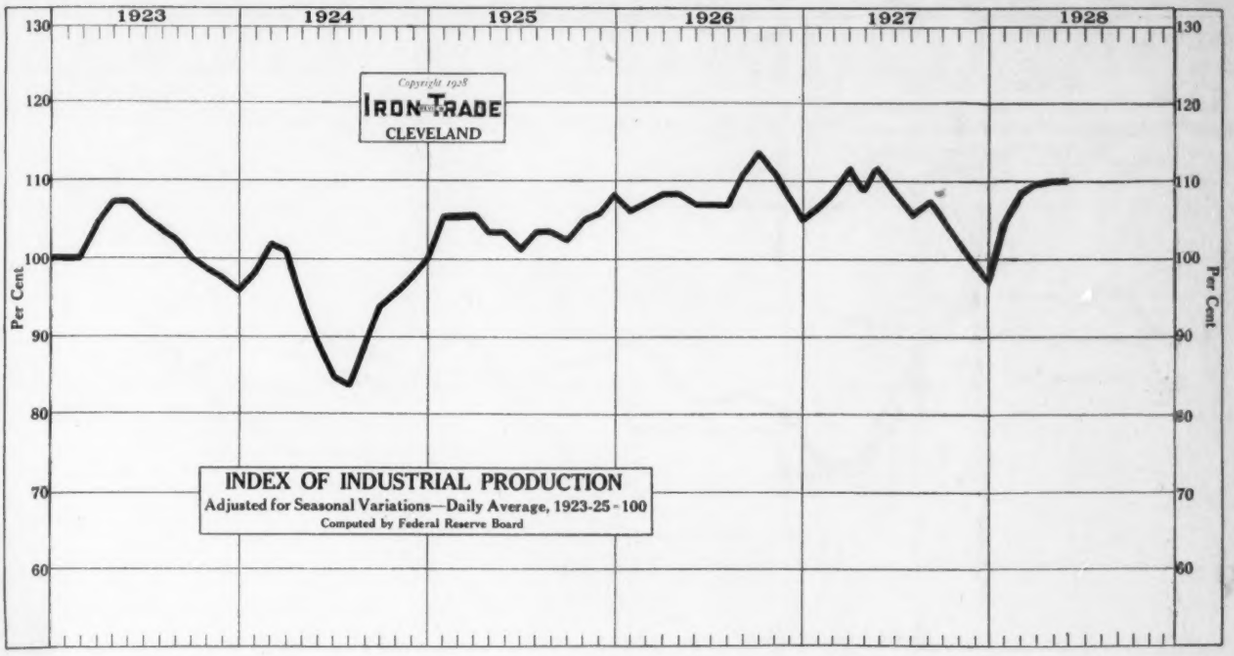
THIS decline was due chiefly to smaller shipments of coal and ore. Cumulative shipments of ore from the first of the year to June 9 dropped 27 per cent below one year ago. This reflected the late start of the lake shipping season this year. Coal shipments were off 14 per cent, compared with the high peak of coal output early in 1927 against the strike. Meanwhile shipments of general merchandise declined only a little more than 1 per cent.

WITH the first half of 1928 making a fairly good showing in industry and business, what are the prospects for the last half? One forecaster, the Brookmire Economic Service, after a careful survey of the outlook arrives at a conclusion that is both logical and convincing. This service believes that the conditions making for depression in trade and unemployment in 1927 have largely been corrected.

THE minor depression in 1927, which might have been a major one, had money conditions been stringent, was the result partly of readjustment of the motor car industry caused by the obsolesence of Ford's Model T; a congested condition in real estate markets; and adverse conditions in various foreign countries.

WITH these factors largely corrected, Brookmire's looks for business to show expansion from its present levels. The leading participants in this improvement are expected to be the automobile, building, and steel industries, together with railroad traffic, foreign trade and more moderate money rates. Although the summer is likely to see little change, the trend over the last six months probably will be upward.

The Business Trend

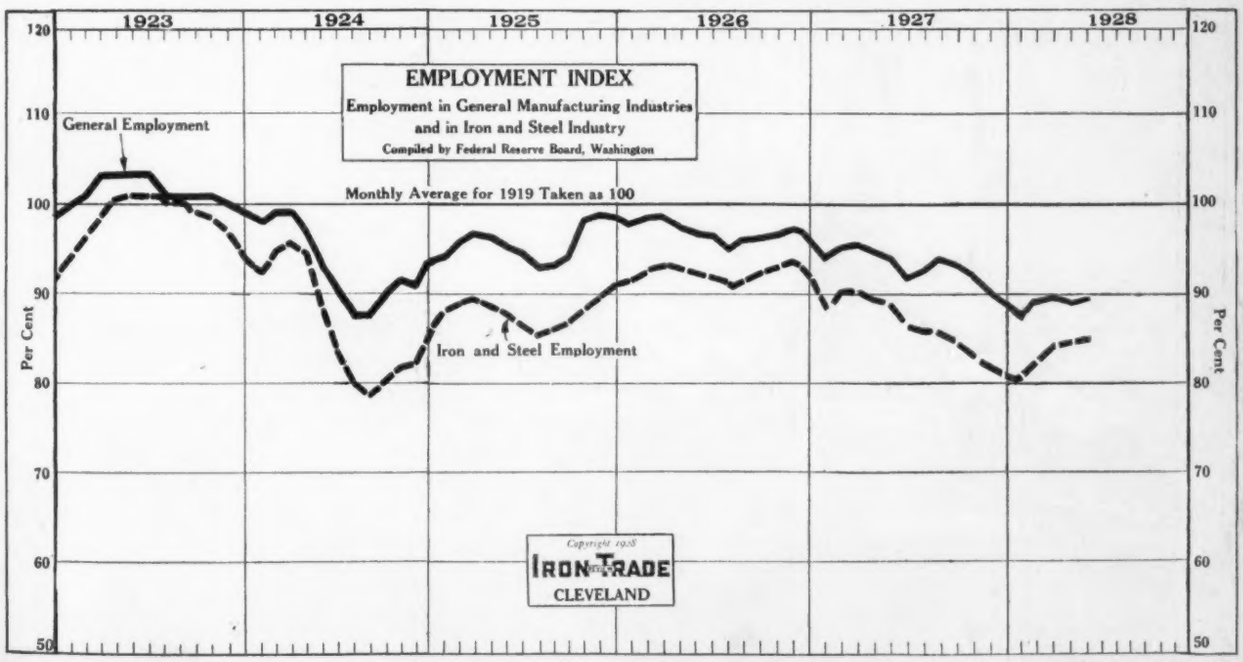


Industrial Production

INDUSTRIAL production continued at an unchanged level in May, according to the computation of the federal reserve board. The index of the board stood at 109 in May, as in April. In January the index was 105 and in May, 1927, it stood at 111. General industrial activities although spotty have displayed considerable vigor during the past spring, and in some lines new high records have been attained. When allowance is made for seasonal variations the output of manufacturers dropped slightly.

Employment Index

GENERAL factory employment throughout the United States showed a slight upward turn during May. The index, as compiled by the federal reserve board at Washington, stood at 89.4 for May compared with 89.3 in April. In January the index was at 87.9. Iron and steel mill employment continues to improve and the index in May was at 84.9 compared with 84.2 in the preceding month and 80.7 in January. Figures for both total employment and iron and steel employment continue below 1927.



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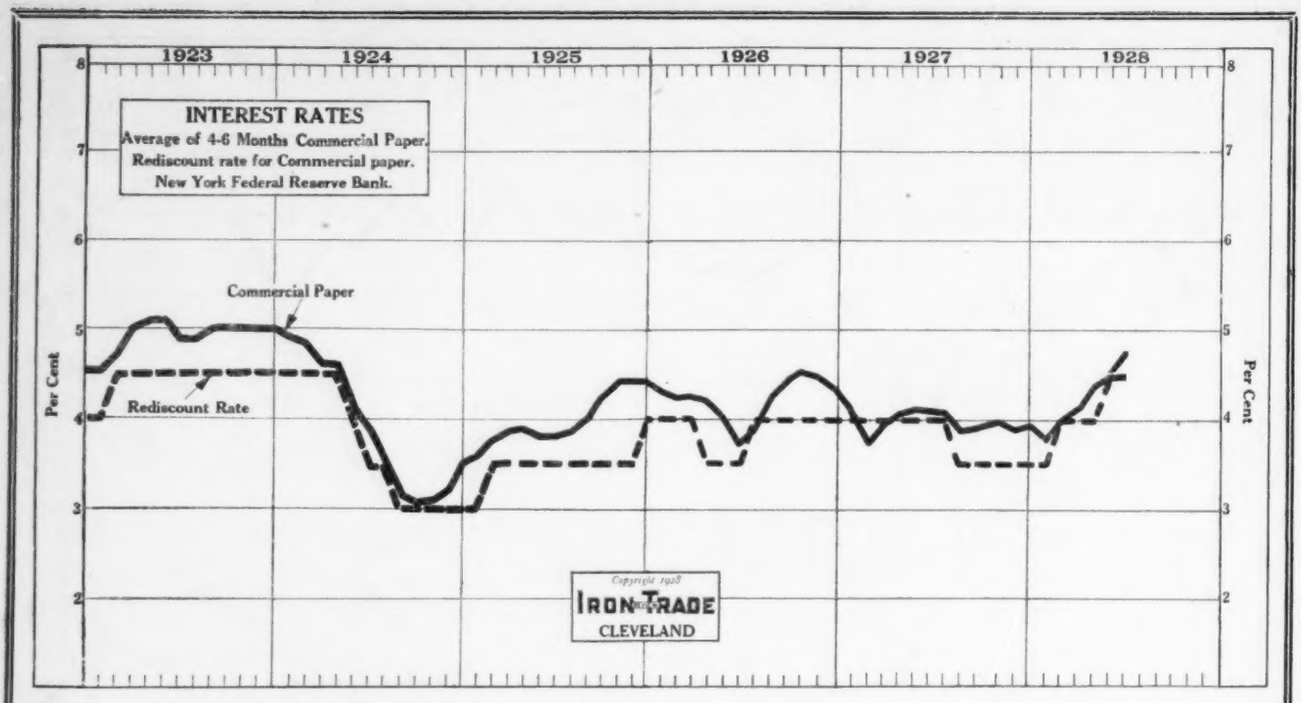
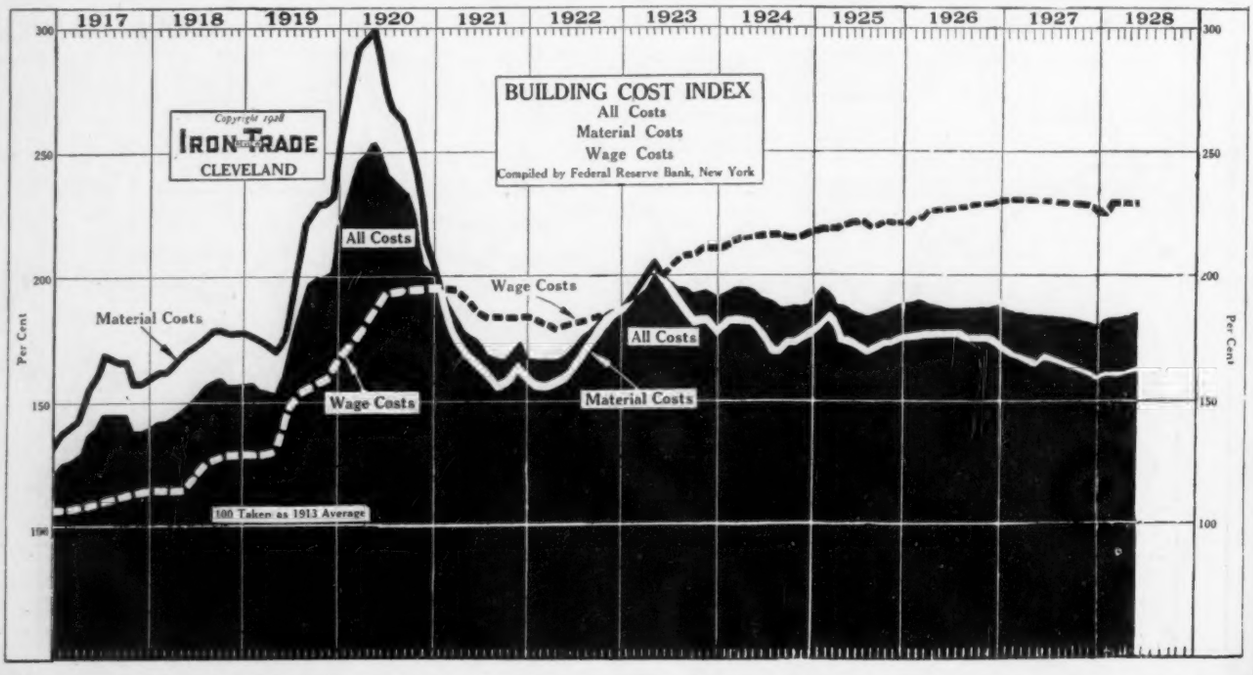


Interest Rates

MONEY rates have continued to hold firm during the past month, and commercial paper has advanced slightly. Mid-year financial settlements caused stock exchange call money rates to go to the highest level in seven years. With the gold movement continuing at a high rate, one of the important factors which brought about the stiffness of money still is operating. The other important factor, that of excessive stock market speculation, has abated. As a result, brokers' loans are down substantially.

Building Cost Index

THE cost of building in the United States which has been advancing during the current year made a further upward move in April. The index, as compiled by the Federal Reserve bank of New York, stood at 189 compared with 187 in the preceding month and 186 in January. One year ago the index stood at 191. Wages, at an index of 230, remain unchanged, while building material stood at an index of 161 in May against 159 in April and 157 in January. One year ago this index stood at 166.



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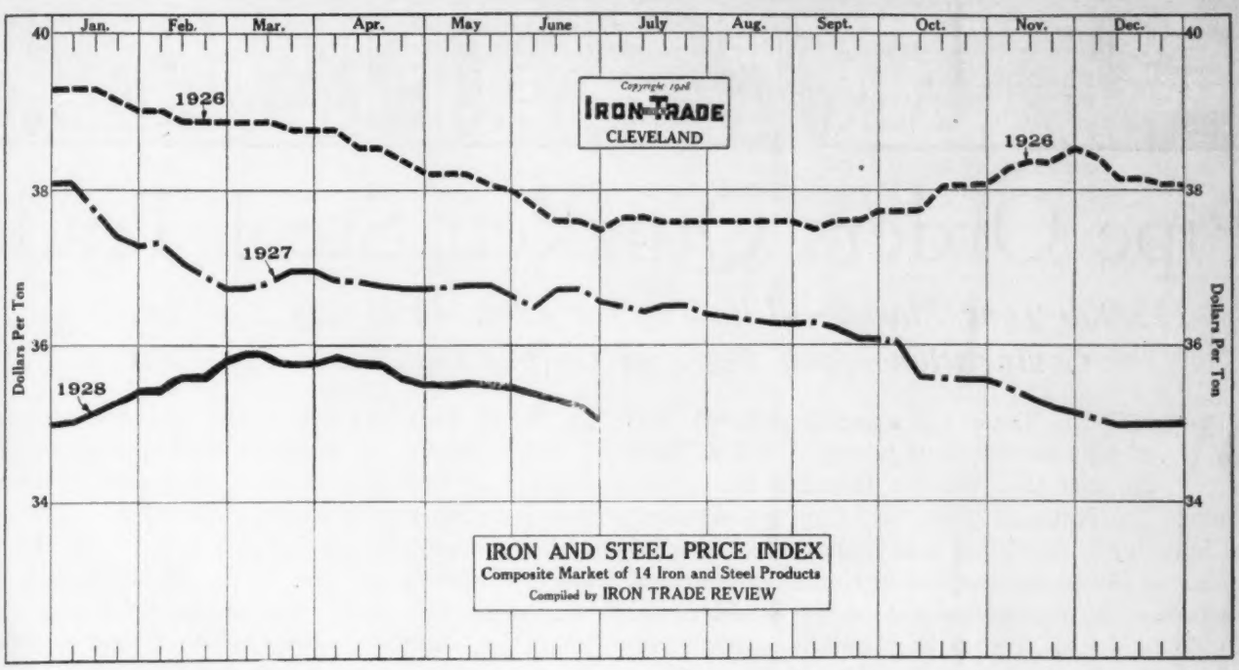
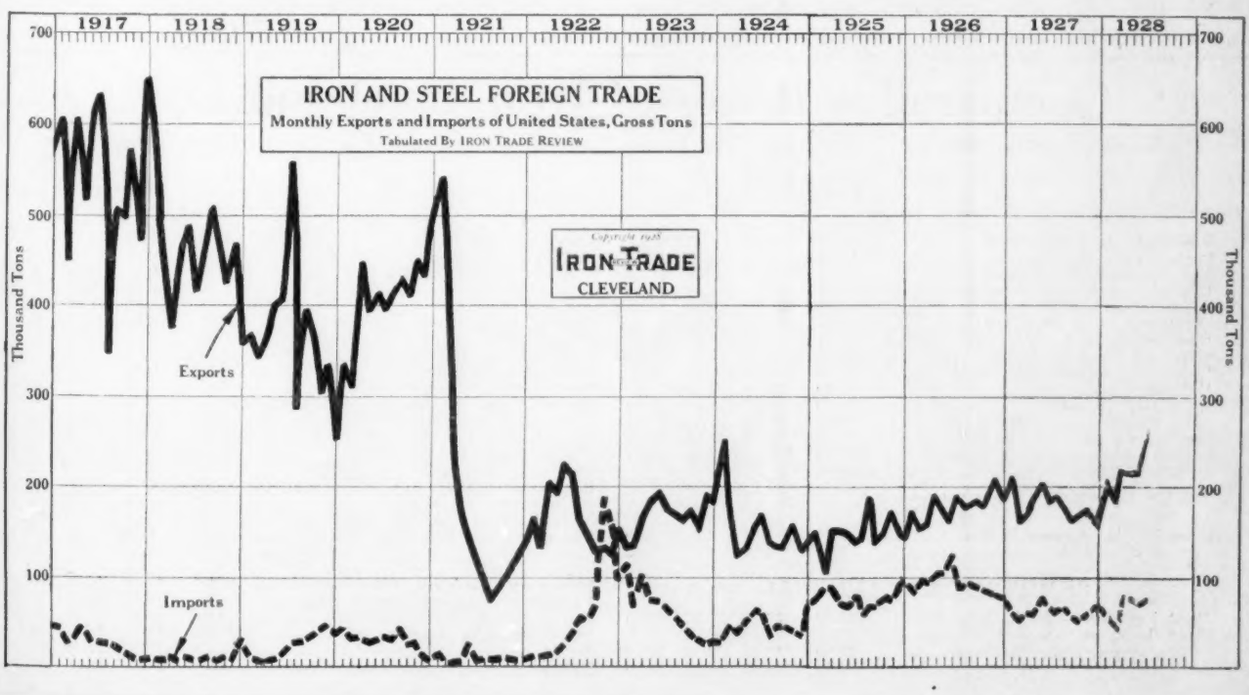


Iron and Steel Price Index

JUNE was a month of declining prices in the iron and steel trade. IRON TRADE REVIEW'S composite market average of 14 products in the last week of the month stood at $35.05 a ton. This compared with $35.50 a ton one month before. Weakness in prices has been most pronounced in the pig iron market. Prices of heavy finished steel and sheets also have weakened and recessions have been reported for various light products. IRON TRADE REVIEW index is at the lowest level since April, 1922.

Iron and Steel Foreign Trade

MAY exports of iron and steel products were the highest for any month since February, 1921. The total was 267,890 tons compared with 215,184 tons in April and 202,708 tons in May, 1927. Imports of 72,106 tons compared with 71,579 tons in April and with 79,814 tons in May one year ago. Exports during the first five months of the year of iron and steel products amounted to 1,096,690 tons compared with 947,504 tons for the like period of 1927. Imports for the period were 324,076 tons.



Pipe Orders Quicken Steel Trade

115,000 Tons Placed—Mills Try for 1.90c on Heavy Steel but Meet Competition—June Pig Iron Output Declines 3 Per Cent

WITH the Texas Co. awarding 65,000 tons of pipe to the Youngstown Sheet & Tube Co. and the Atlantic Refining Co. 50,000 tons to the National Tube Co., the long dormant oil industry is providing real tonnage for the pipe mills. A 25,000-ton gas line in Kentucky is active, while the 150,000-ton project of the Standard Oil Co. from Monroe, La., to St. Louis is slowly shaping up. Only ten days ago the National Tube Co. and Spang, Chalfant & Co. divided 50,000 tons for the Empire Gas & Fuel Co.

Markets Active Considering the Season

This activity in pipe inspirits a steel market already vigorous, from the standpoint of consumption, for early July. Automotive requirements continue substantial; in fact, in some lines they are pressing enough to restrict the July 4 holiday. Some departments of the farm implement industry—notably tractors—are at capacity. The railroads have been a shade more liberal with track accessory orders, and the rumor is again current that heavy buying of cars and track material is slated for this quarter. Building steel awards at 34,197 tons are above the seasonal average.

Order books of finished steel producers, especially of the heavier lines, still fail to mirror this satisfactory consuming situation. On bars, plates and shapes the impasse between producers and consumers on the 1.90c, Pittsburgh, price continues, but with indications producers will press for contracts. Consumers in most districts have been satisfying their requirements by spot purchases, usually at the prices they latterly have been paying. Contracting in the lighter steel lines has been at prevailing low prices. Recent efforts of steel producers to strengthen export quotations having been successful, they may look next to the domestic price situation.

Pig Iron Output Matches Last June

Although pig iron production declined 3 per cent in June, to a daily rate of 102,963 tons, it paralleled the rate of 102,991 tons of June, 1927. The month's total of 3,088,882 tons compares with 3,292,790 tons in May and 3,089,726 tons last June. The six-month total stands at 18,517,005 tons, against 19,429,227 tons in the like

Comparative Prices of Iron, Steel and Coke

Representative Market Figures for This Week, Last Month, Three Months and One Year Ago

	July 4, 1928	June 1928	Apr. 1928	July 1927
PIG IRON				
Bessemer, del., Pittsburgh	$18.76	18.76	19.26	20.26
Basic, valley	15.75	15.81	16.75	17.50
Basic, eastern, del. eastern Pa.	19.10	19.10	19.25	20.50
*No. 2 foundry, del., Pittsburgh	18.26	18.61	19.01	19.26
No. 2 foundry, Chicago	18.00	18.00	18.50	20.00
*Southern No. 2 Birmingham	15.50	15.90	16.00	17.45
*Southern Ohio, No. 2 Ironton	19.00	19.00	19.00	19.00
**No. 2X, Virginia furnace	20.50	20.50	20.50	22.00
**No. 2X, eastern, del. Phila.	20.76	21.26	21.26	21.51
Malleable valley	17.00	17.00	17.25	17.50
Malleable, Chicago	18.00	18.00	18.50	20.00
Lake Superior charcoal del. Chicago	27.04	27.04	27.04	27.04
Gray forge, val., del. Pittsburgh	18.76	18.76	18.56	18.76
Ferromanganese, del. Pittsburgh	109.79	109.79	104.79	94.79
*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.				
COKE				
Connellsville, furnace, ovens	2.60	2.60	2.60	2.90
Connellsville, foundry ovens	3.50	3.50	3.65	4.00
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngstown	33.00	33.20	32.75	33.75
Sheet bars, open-hearth, Pittsburgh	33.00	33.50	34.00	33.50
Billets, open-hearth, Pittsburgh	32.00	32.50	33.00	33.00
Wire rods, Pittsburgh	42.00	44.00	44.00	43.00

	July 4, 1928	June 1928	Apr. 1928	July 1927
FINISHED MATERIAL				
Steel bars, Pittsburgh	1.85	1.85	1.85	1.80
Steel bars, Chicago	2.00	2.00	2.00	2.00
Steel bars, Philadelphia	2.17	2.17	2.17	2.12
Iron bars, Chicago	2.00	2.00	2.00	2.00
Shapes, Pittsburgh	1.85	1.85	1.85	1.80
Shapes, Philadelphia	2.06	2.06	2.08	2.07
Shapes, Chicago	2.00	2.00	2.00	2.00
Tank plates, Pittsburgh	1.85	1.85	1.85	1.80
Tank plates, Philadelphia	2.10	2.10	2.10	2.12
Tank plates, Chicago	2.00	2.00	2 00	2.00
Sheets, black, No. 24, Pittsburgh	2.65	2.70	2.75	3.00
Sheets, blue anl., No. 10, Pittsburgh	2.00	2.00	2.05	2.25
Sheets, gal., No. 24, Pittsburgh	3.50	3.55	3.65	3.85
Sheets, black, No. 24, Chicago	2.80	2.80	3.05	3.15
Sheets, blue anl., No. 10, Chicago	2.15	2.15	2.25	2.40
Sheets, galvanized, No. 24, Chicago	3.65	3.70	3.90	4.00
Plain wire, Pittsburgh	2.50	2.50	2.50	2.40
Wire nails, Pittsburgh	2.60	2.60	2.60	2.55
Tin plate, per base box, Pittsburgh	5.25	5.25	5.25	5.50
SCRAP				
Heavy melting steel, Pittsburgh	14.50	14.70	14.85	14.95
Heavy melting steel, eastern Pa.	13.00	13.15	13.75	13.75
Heavy melting steel, Chicago	12.50	12.60	12.75	12.10
No. 1 wrought, eastern Pa.	15.25	15.25	15.25	16.25
No. 1 wrought, Chicago	12.30	12.75	12.45	12.35
Rails for rolling, Chicago	14.50	14.85	14.00	14.60

Current Prices for Rolled Steel Products

PRICES IN CENTS PER POUND UNLESS OTHERWISE INDICATED

STEEL PLATES

Pittsburgh	1.85c to 1.90c
Philadelphia, del	2.10c to 2.15c
New York, del	2.175c to 2.225c
Boston, del.	2.265c to 2.415c
Chicago	2.00c
Cleveland	2.04c to 2.09c
Buffalo	2.00c
Coatesville, Sparrows Point	1.95c to 2.00c
Birmingham	2.00c
Pacific Coast, c.i.f.	2.25c to 2.30c

STRUCTURAL SHAPES

Pittsburgh	1.85c to 1.90c
Philadelphia, del.	2.01c to 2.11c
New York, del.	2.14c to 2.19c
Boston, del.	2.265c to 2.415c
Chicago	2.00c
Cleveland, del.	2.04c to 2.09c
Buffalo	2.00c
Bethlehem	1.95c to 2.00c
Birmingham	2.00c
Pacific Coast, c.i.f.	2.35c

BARS

SOFT STEEL

Pittsburgh	1.85c to 1.90c
Chicago	2.00c
Birmingham	2.00c
Buffalo	2.00c
San Francisco	2.35c
Cleveland, mill	1.85c to 1.90c
Cleveland, delivered	1.87½c and 2.09c
Philadelphia, delivered	2.17c to 2.22c
New York, delivered	2.19c to 2.24c
Boston, delivered	2.265c to 2.415c
Pittsburgh, cold finishing	2.00c to 2.05c
Pittsburgh, forging quality	2.10c to 2.15c

RAIL STEEL

Chicago	1.85c to 1.90c
Eastern mills	1.75c

IRON

Chicago	2.00c
New York, delivered	2.14c to 2.24c
Philadelphia, delivered	2.12c to 2.22c
Pittsburgh, refined	2.75c to 4.25c

REINFORCING

Pittsburgh, billet	1.85c to 1.90c
Chicago, billet	2.30c to 3.00c
Chicago, rail steel	2.00c to 2.60c
Chicago, rail steel, road and bridge work	1.85c to 1.95c
Youngstown, billet	1.90c to 2.00c

COLD FINISHED STEEL

Cold finished steel bars, drawn or rolled, Pitts., Chi., c.l.	2.10c
Shafting (turned, polished) Pittsburgh	2.10c
Shafting (turned, ground) mill (Depending on size, 1 3/16 to 7-inch)	2.45c to 2.90c
Cold finished steel bars, Cleve.	2.15c

TIN AND TERNE PLATE

Prices per 100-pound box, Pittsburgh

*Tin plate, coke base	$5.25
Gary, Ind., base 10 cents higher.	
Long ternes, primes, No. 24	4.10c

*Price subject to quantity differentials.

SHEETS

SHEET MILL BLACK

No. 24, Pittsburgh, base	2.60c to 2.70c
No. 24, Philadelphia, delivered	2.92c to 3.02c
No. 24, Gary Indiana Harbor	2.75c
No. 24, Chicago, delivered	2.80c
No. 24, Birmingham, base	3.00c

TIN MILL BLACK

No. 28, Pittsburgh, base	2.85c to 2.90c
No. 28, Gary, base	2.95c to 3.00c

GALVANIZED

No. 24, Pittsburgh, base	3.45c to 3.50c
No. 24, Philadelphia, delivered	3.77c to 3.82c
No. 24, Gary, Indiana Harbor	3.60c
No. 24, Chicago, delivered	3.65c
No. 24, Birmingham, base	3.80c

BLUE ANNEALED

No. 10, Pittsburgh base*	1.90c to 2.10c
No. 10, Philadelphia, delivered	2.32c to 2.42c
No. 10, Gary, Indiana Harbor	2.10c
No. 10, Chicago, delivered	2.15c
No. 10, Birmingham, base	2.20c to 2.25c

*Plus 10 cents for 40 inches or wider.

AUTOMOBILE

No. 20, Pittsburgh, base	4.00c

IRON

No. 10, Pitts., blue ann., c.l.	2.80c
No. 24, Pitts., box annealed, 1-pass cold rolled, carload	3.75c
No. 24, Pitts., gal., c.l.	4.85c

(Turn to the following page)

period of 1927 and 19,850,913 in the record pig iron year of 1926. At the close of June 199 stacks, or eight fewer than at the beginning, were in blast, the entire loss being sustained in steelworks production. Pig iron sales the past week have been only moderate, with about 60 per cent of the third quarter's needs covered.

Plate and skelp mills, especially in the Pittsburgh district, have received a new lease on life with prospective participation in recent heavy pipe business. New inquiry at Chicago for riveted pipe calls for 14,000 tons of plates, with the 12,000-ton water line for Denver nearing placement. Bar demand is sufficient for 80 per cent mill operations at Chicago and 65 to 70 per cent at Pittsburgh. One producer at Chicago has taken some 2-cent third quarter business, but this level hinges upon the fate of the proposed 1.90c, Pittsburgh, price. Some bar contracts have been written at this price in Cleveland.

Sheet Mills Have Light Week

Save for full-finished sheets for the automobile trade, demand for sheets has been light in all districts. Holiday interruptions will be more pronounced in sheets than in other finished lines. Contracting for cold finished bars for third quarter has been brisk at the reduced 2.10c, Pittsburgh-Chicago, price. Hoop and band prices continued demoralized. In the East wide hot strip has sold down to 1.75c, Pittsburgh. Preliminary estimates place June freight car awards at about 2063, which would give the first half year a total of only 26,700, contrasted with 42,165 in the first half of 1927. Last June the railroads ordered 7440 cars. The Norfolk & Western will rebuild 500 steel gondolas in its shops and is inquiring for 40,000 tons of rails.

Coke Wages Cut 11 Per Cent

The first revision since 1922 in the wage scales of the H. C. Frick Coke Co. is a reduction averaging 11 per cent, effective July 1. Other coke producers have not acted.

Once the federal trade commission has formally approved the Steel Export Association of America, for which the United States Steel Corp. and Bethlehem Steel Co. are sponsors, adherence of leading independent producers doing an export business is expected. Close co-operation with similar European groups seems probable. American prices on sheets, tin plate and wire rods for export already have been advanced.

Holiday shutdowns this week vary according to the state of demand. Many sheet mills are suspended virtually all week for usual midsummer repairs, while cold finished bar mills are off only one day. Steelmaking operations for the entire industry continue at about 72 per cent. Chicago is off two points this week, to 78 per cent, while Pittsburgh is at about 70 and Buffalo 85.

Composite Market Average

Based on Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

This week (July 4, 1928)	$34.93
Last week (June 27, 1928)	35.05
One month ago (June, 1928)	35.30
Three months ago (April, 1928)	35.67
One year ago (July, 1927)	36.41
Ten years ago (July, 1918)	56.66
Fifteen years ago (July, 1913)	26.34

A further recession of 12 cents in the IRON TRADE REVIEW composite of fourteen leading iron and steel products this barometer down to $34.93, the lowest point since early 1922. A month ago the composite stood at $35.46.

Current Rolled Steel Prices

PRICES IN CENTS PER POUND UNLESS OTHERWISE INDICATED

SEE ALSO PRECEDING PAGE

HOOPS, BANDS, STRIP

Hot strip, under 3-inch, Pitts. 2.10c to 2.20c
Hot strip, 3 to 6-inch, Pitts. 2.00c to 2.10c
Hot strip, 6 to 12-inch, Pitts. 1.90c to 2.00c
Hot rolled strip, 12 to 24-inch 16 gage and heavier, coils or cut lengths, 1.85c plate basis, or 1.90c blue annealed basis.
Hot strip, under 3-in., Chi..... 2.30c
Hot strip, 3 to 6-in., Chi..... 2.20c
Hot strip, 6 to 12-in., Chi..... 2.00c
Hot strip, 12 to 24 in., Chi.... 2.10c
blue annealed sheet basis.
Cold rolled strip, hard coils, 1½ inches and wider by 0.100-inch and heavier base, Pitts., Cleve., (over 3 tons) ..... 2.75c to 2.90c
Pitts., Cleve., (1-3 tons)..... 3.00c to 3.15c
Worcester, Mass. 3.05c

ALLOY STEEL

Hot Rolled
F.o.b. Pittsburgh or Cleveland
Alloy Quality Bar Base is 2.65c

S.A.E. Series Number	Alloy differential	Net price 100 lb. bars
2000	0.25	$2.90
2100	0.55	3.20
2300	1.50	4.15
2500	2.25	4.90
3100	0.55	3.20
3200	1.35	4.00
3300	3.80	6.45
3400	3.20	5.85
4100 0.15-0.25 Mo.	0.50	3.15
4100 0.25-0.40 Mo.	0.70	3.35
4600 0.20-0.30 Mo. 1.25-1.75 Ni.	1.05	3.70
5100 0.60-0.90 Cr.	0.35	3.00
5100 0.80-1.10 Cr.	0.45	3.10
5100 Chrome Spring	0.20	2.85
6100 Bars	1.20	3.85
6100 Spring Steel	0.95	3.60
Chrome Nickel Vanadium..	1.50	4.15
Carbon Vanadium	0.95	3.60
9250	0.25	2.90

TUBING

BOILER

Carload Discounts—Less-carloads 4 points Lower—F.o.b. Pittsburgh Mills
Steel 3¼ to 8¾-inch 42½
Charcoal iron, 3¼ to 4½-inch 9
Seamless hot rolled 3¼ to 3½-inch.... 46
Further discounts of six 5 per cents for 21,000 pounds or more on lap welded steel. On seamless hot rolled several more 5 per cents, and on charcoal two 10's and one 2½ on 12,000 pounds or more.

COLD DRAWN SEAMLESS

F.o.b. mill in desirable quantities
Random lengths over 5 feet.....55 per cent
Selected lengths, 1 to 18 ft.....58 per cent

WIRE PRODUCTS

To Jobbers in Carloads

F.o.b. Cleveland and Pittsburgh base.
Dealers 5 cents per 100 pounds extra

Bright plain wire, No. 9 gage..	2.50c
Annealed fence wire	2.65c
Galvanized wire, No. 9 gage....	3.10c
Barbed wire, painted	3.10c
Barbed wire, galvanized	3.35c
	Per 100 lbs.
Wire nails.....	$2.55 to 2.65
Galvanized nails	4.55 to 4.65
Polished staples	3.00 to 3.10
Galvanized staples	3.25 to 3.35
Coated nails, 100 lb. kegs, Sept. 1, 1926 extras apply....	2.55 to 2.65
Woven wire fencing (retailers) 12½ gage, 26-in. high, 7-in. bars and 12-in. stays, per 100 rods, f.o.b. Pitts.....	$20.03

Joliet, DeKalb and Waukegan, Ill., Anderson, Ind., and Chicago prices $1 per ton over Cleveland-Pittsburgh base on products made there; Duluth $2 higher, Worcester, Mass., and Fairfield, Ala., $3 higher.

CAST IRON WATER PIPE

Prices per net ton
Class B Pipe

Six inch and over, Birming'm	$31.00 to 33.00
Four-inch, Birmingham	35.00 to 37.00
Four-inch, Chicago	43.20 to 45.20
Six-inch to 24-inch, Chicago.....	39.20 to 41.20
Four-inch, New York	41.50 to 42.60
Six-inch and over, New York	38.25 to 38.60
Standard fittings, Bir. base.....	$100 00

Six to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher.
Class A pipe is $4 higher than Class B.

IRON AND STEEL PIPE

Base Discounts Pittsburgh and Lorain, O., to Jobbers in Carloads

	Black	Galv.
1 to 3-inch butt steel*	62	50½
1 to 1½-inch butt iron	30	13

Indiana Harbor, Ind., and Evanston, Ill., 2 points less, Chicago del., 2½ points less.
*To large jobbers these discounts are increased on black by 1 point and a supplementary discount of 5 per cent; on galvanized by 1½ points with a supplementary 5 per cent.

CHAIN, PILING, CUT NAILS

Cut nails, c.l., f.o.b. mills.....	2.70c
Cut nails, l.c.l., f.o.b. mills....	2.80c
Chain, 1-in., proof coil, Pitts.....	6.00c
Sheet piling base, Pittsburgh..	2.25c

RAILS, TRACK MATERIAL

Standard bessemer rails, mill	$43.00
Standard open-h'th rails, mill	$43.00
Relaying rails, St. Louis	$24.00 to 31.00
Relay, rails, Pitts. 60 to 90 lb.	$22.00 to 27.00
Light rails, 25 to 45, mills.....	$36.00
Angle bars, Chicago base.....	2.75c
Spikes, railroad, Pittsburgh....	2.80c
Spikes, small railroad, ⅞-inch and smaller, Pitts.....	2.80c
Spikes, boat and barge, Pitts.	3.00c
Spikes, railroad, Chicago	2.80c
Track bolts, Pitts., steam roads	3.80c
Track bolts, Pitts., stand, jobbers	70 off list
Track bolts, Chicago	3.80c
Tie plates, Chicago, Pitts.....	$43.00

BOLTS AND NUTS

F.o.b. basing points, Pittsburgh, Cleveland Birmingham and Chicago
Discounts are for legitimate jobbing or large consuming trade purchasing in full-case lots, apply to lists of April 1, 1927.
Small lots are 55 to 60 per cent off.

CARRIAGE BOLTS

All sizes, cut thread ..... 60 to 70 off
Rolled thread ⅜x6 and smaller take 10 per cent lower list.
Eagle list ..... 60 to 70 off

MACHINE BOLTS

All sizes, cut thread ..... 60 to 70 off
Rolled thread ⅜x6 and smaller take 10 per cent lower list.
Lag screws ..... 60 to 70 off
Plow bolts, Nos. 1-2-3-7 heads 60 to 70 off
Tap bolts ..... 60 to 70 off
Blank bolts ..... 60 to 70 off
Stud bolts without nuts..... 60 to 70 off
Stove bolts, 75, 20, 10, and 5 off in pkgs. 75, 20, 10 and 5 with 2½ off in bulk.
Tire bolts .....60-5 off

NUTS

Semifinished ..... 60 to 70 off

HEXAGON CAP SCREWS

Milled .....80-10-10 off
Upset 1 in. diam. and smaller.....85-5 off

SQUARE HEAD SET SCREWS

Milled .....80-10 off
Upset 1in. diam and smaller.....80-10-10 off

RIVETS

Struct., c.l., Pitts.-Cleve..... 2.90c
Structural, c.l., Chicago..... 3.00c
**⅞-inch and smaller, Pitts.....70 and 10 off
Chi., Cleve. .....70 to 70 and 10 off
**Some makers quoting 70 off with freight allowed on 300 pounds or more.

WASHERS

Wrought, c.l., Pitts. dist.....$6.50 to 6.75 off
Wrought, c.l., Chicago dist.....$6.70 to 6.90 off
Lock: To dealers .....85-5 off
Lock: To consumers .....85 off

Raw Materials and Semifinished Products

SEMIFINISHED MATERIAL

Prices per gross ton

BILLETS AND BLOOMS
4 x 4-inch base

Pittsburgh, open-hearth.....	$32.00 to 33.00
Pittsburgh, bessemer	32.00 to 33.00
Youngstown	32.00
Cleveland	33.00
Philadelphia	38.30
Chicago	34.00
Forging, Chicago	38.00 to 43.00
Forging, Pittsburgh	38.00
Forging, Philadelphia	43.30

SHEET BARS

Pittsburgh	33.00
Youngstown	33.00
Cleveland	32.50 to 33.00
Chicago	35.00

SLABS

Pitts., Young., and Cleve.....$32.00 to 33.00

WIRE RODS

Pittsburgh, Cleveland .....$42.00 to 45.00	
Chicago	45.00

SKELP

All grades, Pittsburgh ..... 1.85c to 1.90c

IRON ORE

LAKE SUPERIOR ORE
Per Gross Ton, Lower Lake Ports

Old range bessemer, 51½%....	$4.55
Mesabi bessemer, 51½%	4.40
Old range bessemer 51½%.....	4.40
Mesabi nonbessemer, 51½%.....	4.25

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 58-63%.....	8.00 to 8.50
Copper free low phosphorus 58 to 65 per cent	nominal

FOREIGN IRON ORE

Cents per unit, alongside docks, Atlantic ports

Foreign manganiferous ore, 45-55% iron, 6-8% manganese	11.00
North African low phosphorus	10.00 to 11.00
Swedish foundry or basic, 65%....	none offered
Spanish and North African basic, 50 to 60 per cent.....	8.50 to 10.00
Newfoundland foundry, 55%....	8.50 to 9.00

MANGANESE ORE

Prices do not include duty of 1 cent per pound of metallic manganese contained.

Brazilian	36 to 38 cents
Indian	36 to 38 cents
Caucasian (53-55 per cent)	38 to 40 cents

FLUORSPAR

85 and 5 per cent grade

Washed gravel, Kentucky and Illinois mines, per net ton....	$15.00 to 16.00
Washed gravel, imported duty paid, enst. tidewater, net ton	15.50 to 16.50

REFRACTORIES

FIRE CLAY BRICK
Per 1000 f.o.b. works

First Quality

Pennsylvania	$43.00 to 46.00
Ohio	43.00 to 46.00
Illinois	43.00 to 46.00
Kentucky	43.00 to 46.00
Missouri	43.00 to 46.00
Maryland	43.00 to 46.00
Georgia and Alabama	40.00 to 45.00

Second Quality

Pennsylvania	35.00 to 38.00
Ohio	35.00 to 38.00
Illinois	35.00 to 38.00
Kentucky	35.00 to 38.00
Missouri	35.00 to 38.00
Maryland	35.00 to 38.00
Georgia and Alabama	30.00 to 35.00

SILICA BRICK

Pennsylvania	43.00
Joliet, Ill., East Chicago, Ind....	52.00
Birmingham	50.00 to 51.00

MAGNESITE BRICK
Per Net Ton

9 x 4½ x 2½	65.00

MAGNESITE

Net Ton Chester, Pa., and Baltimore base	
Dead-burned grain magnesite....	40.00

CHROME BRICK

Net Ton Chester, Pa., and Baltimore base.	
9 x 4½ x 2½	45.00

Pig Iron

Sixty Per Cent of Third Quarter Requirements Covered, Producers' Estimate—Large Basic Sales Still Made—Inquiries Taper Off

AT THE beginning of the third quarter about 60 per cent of pig iron requirements have been covered, according to the estimates of some leading producers. June shipments generally did not hold up to the May average, although close to it, and was larger than for June, 1927. Buyers show considerable caution in committing themselves for third quarter, and competition still is keen. Sales by Cleveland furnace interests during the past week totaled 38,500 tons, about 8000 tons more than in the preceding week, although new inquiries showed considerable decline. Large tonnages of basic iron continue to purchase, Follansbee Bros. Co., having closed for 10,000 tons. Average of actual sales prices of basic iron in June, as compiled by W. P. Snyder & Co. was $15.43.

PITTSBURGH, July 3.—Activity in the pig iron market is subsiding after the large sales of basic iron as noted in the past several weeks. Follansbee Bros. Co. is understood to have closed for 10,000 tons of basic with its regular source of supply, which producer has been quoting $17, delivered, its freight rate to Follansbee, W. Va., being $1.13, while to Toronto, O., it is 90 cents against a valley rate to the latter point of $1.76. The National Malleable & Steel Castings Co., Sharon, Pa., still is negotiating for a large tonnage of basic. Valley merchant stacks are quoting $16. Some are not hoping to get the business because lower figures, by at least 25 cents, have not disappeared. Bessemer iron sales are limited to single carloads to 150 tons at a time at $17, valley. The A. M. Byers Co., Warren, O., has not yet covered its bessemer iron requirements for which it recently began negotiations. Few inquiries are pending for foundry iron, and none for malleable. The latter is quoted $17, base, valley, while some makers quote the same figure on No. 2 plain foundry iron and others still are naming $16.75 and even $16.50, valley. The Westinghouse Electric & Mfg. Co.'s inquiry for Trafford City, Pa., as noted last week, is the only worthwhile inquiry pending.

The average sales price of bessemer iron in June was $17, compared with $17.287 in May, according to W. P. Snyder & Co. The basic iron average for June was $15.43, against $16.25 in May.

Boston, July 3.—The pig iron market is quiet. While a few foundries report business as poor, the melt continues at about the same volume. Sales in the past week approximated 2000 tons. Prices are steady.

Buffalo, July 3.—Less than 3000 tons of new inquiry for pig iron is pending in this district. Some hand-to-mouth buying has been done for early July shipment. Merchants cut into their stockpiles last quarter and have piled no iron recently. Buffalo district prices are firm at $17 for foundry and $17.50 for malleable. It is said shading on outside business does not exceed 50 cents a ton. Large shipments are being made to eastern seaboard by barge canal.

New York, July 3.—Worthington Pump & Machinery Corp. has purchased 700 tons of foundry iron for its plants at Holyoke, Mass., Buffalo and Harrison, N. J. Other sales in this territory are estimated as having aggregated 4000 tons. New inquiry is light. A firmer price tendency is noted, and Buffalo iron at less than $16.50, base, Buffalo, now is unusual, while on the No. 2X grade $17, Buffalo, is being done in most instances.

Cleveland, July 3.—Pig iron consumers are buying carefully and cautiously for third quarter, and while the general run of business from week to week is fair, leading producers estimate that not more than 60 per cent of third quarter requirements are covered. Sales made by Cleveland interests in the past week amounted to 38,500 tons, exceeding the preceding week's business by 8500 tons. Inquiries, however, are less important, about 8000 tons pending. June shipments were as large as those of May in the experience of most furnace interests here, though one producer reports a slight decrease due to mid-season inventory at consumers' plants. The price $17.50, base, furnace, for local delivery, quoted by one local furnace company a week ago has been adopted by another Cleveland producer. For outside shipment $16.25 appears to be minimum.

Cincinnati, July 3.—The July Fourth holiday is causing some melters to hold back shipping instructions. Two southern Ohio buyers have closed on 500 tons each of northern iron. A Louisville, Ky., melter has bought 200 tons of southern. Inquiry for requirements covering the third quarter are somewhat broader.

Chicago, July 3.—Sellers of northern pig iron have closed several more important tonnages for third quarter but in general forward buying has declined. Spot activity is good. With many smaller melters cautious as to building their stocks shipments are below those of May, but steady, and few holdups are reported. The price continues steady at $18, base, Chicago furnace, although eastern competition is being met by local sellers in western Michigan. Scattered sales of charcoal iron are reported.

St. Louis, July 3.—Due chiefly to price uncertainty, purchasing of pig iron has dwindled. Usual seasonal considerations and a universal desire to hold down inventories are further factors in holding down sales to around the lowest point of the year. While admittedly much iron is to be bought for third and fourth quarters, melters are not disposed to fill their future requirements. The current melt is holding up fairly well, all things considered, and many industries are reporting a larger influx of new business. Jobbing foundries are doing better than a few weeks back, and some specialty makers are at or

(*Concluded on Page* 47)

Pig Iron Prices

Per Gross Ton

Bessemer, valley furnace	$17.00
Bessemer, del., Pittsburgh	18.76
Basic, valley furnace	15.75 to 16.00
Basic, del., Pittsburgh	17.51 to 17.76
Basic, Buffalo furnace	17.00
Basic, del., eastern Pa.	19.00 to 19.25
Malleable, valley furnace	17.00
Malleable, del. Pittsburgh	18.76
Malleable, del. Cleveland	18.00
Malleable, Chicago furnace	18.00
Malleable, Buffalo furnace	17.50
Malleable, del. eastern Pa	20.75 to 21.25
No. 1 foundry, Chicago furnace	18.50
No. 1X, eastern del., Phila.	21.26 to 21.76
No. 1X, Buffalo furnace	18.50
No. 2 foundry, valley furnace	16.50 to 16.75
No. 2 foundry, del., Pittsburgh	18.26 to 18.51
No. 2 plain, Everett, Mass., fur.	19.00 to 21.00
No. 2 plain, Buffalo furnace	17.00
No. 2 foundry, Chicago, furnace	18.00
No. 2 foundry, Granite City	19.00 to 19.50
No. 2 foundry, Ironton furnace	19.00
No. 2 foundry, del. Cleveland	18.00
No. 2 plain, del., Phila	20.26 to 20.76
No. 2 plain Virginia furnace	20.00 to 20.50
No. 2 plain, N. J., tidewater	19.28 to 21.76
No. 2 Alabama, Birmingham	15.50
No. 2 Alabama, del. Cincinnati	19.19
No. 2 Tenn., Birmingham base	15.50
No. 2 Tenn., del., Cincinnati	19.19
No. 2 Alabama, del. Chicago	21.76
No. 2, Ala., del. Chicago, river-rail	19.68
No. 2 Alabama, del. Cleveland	21.76
No. 2 Alabama, del. St. Louis	19.92
No. 2X, east, N. J., tidewater	19.78 to 22.26
No. 2X, eastern, del. Phila.	20.76 to 21.26
No. 2X, foundry, Buffalo furnace	17.50
No. 2X, eastern, del. Boston	23.15 to 23.65
No. 2X, Virginia furnace	20.50
Gray forge, val., del., Pittsburgh	18.76
Low phos., standard, valley	26.50
Low phos., standard, Phila.	24.76 to 27.29
Low phos. copper bearing fur.	23.00 to 23.50
Charcoal, Birmingham	28.00
Charcoal, Superior, del., Chicago	27.04

CANADIAN PRICES

No. 2 foundry, del. Toronto	23.10 to 23.60
No. 2 foundry, del. Montreal	24.50 to 25.00
Malleable, del. Toronto	23.10 to 23.60
Malleable, del. Montreal	24.50 to 25.00
Basic, del. Montreal	23.50 to 24.00

Silvery iron, Jackson county (Ohio) furnace in per cents: 5—$22; 6—$23; 7—$24; 8—$25; 9—$26; 10—$28; 11—$30; 12—$32; 13—$34.

Bessemer ferrosilicon, Jackson county (Ohio) furnace, in per cents: 10—$30; 11—$32; 12—$34; 13—$36; 14—$38; 15—$40.50; 16—$43.

Coke

First Wage Reduction Since 1922 Is Announced by Frick Coke Co. Furnace Fuel Sold for $2.75

LEADING in importance in the week's developments in the coke market is the wage reduction averaging 11 per cent announced July 1 by the H. C. Frick Coke Co., the first cut since 1922. The present nonunion scale of a large independent steelworks in its coal department is slightly above the Frick company's new rates.

Pittsburgh, July 3.—Wage reductions averaging 11 per cent effective July 1 have been announced by the H. C. Frick Coke Co. This is the first change made in its scale since 1922. Laborers have been reduced from $6.55 to $5.05; and drivers, rope riders and other shaftmen from $7.55 to $6.05 per day. The price paid for leveling per oven has been reduced from 31 cents to 26 cents. The trade is interested to see if the new rates are adopted by an independent steel interest whose present nonunion scale in its coal departments is slightly above those of the Frick company's.

Beehive coke demand continues to move along at about the same rate as noted for several weeks. The trade understands the E. & G. Brooke Iron Co. has renewed its contract for the third quarter at $2.75, Connellsville, or Connellsville base. One or two other eastern stacks also have extended arrangements with present sources of supply. Neither the Claire furnace nor the Sharpsville stack is operating. The Shenango Furnace Co. has not formally renewed its contract but is being supplied with coke for one stack's requirements. One eastern gas producer continues to take certain amounts weekly for tests, but defers placing a contract for a year. Producers are quoting $3 for that delivery. Occasional transactions with other buyers involving two or three cars weekly for stipulated periods are being closed through middle interests at $2.75 to consumers. Spot market transactions are rare, but $2.60 or $2.65 still is available for single carloads. Spot market activity in Connellsville foundry coke is confined to the cheaper grades, around $4, although $3.75 and $3.50 still is quoted on single carloads. Practically all contracts for last half now have been covered at $4 to $4.85. A few will be in force for a year from July 1.

Production of coke in the Connellsville region in the week ended June 23 was 38,940 tons, as against 44,430 tons in the preceding week, according to the *Connellsville Courier*.

Boston, July 3.—There will be no change in coke prices this month, the foundry grade remaining at $11. A brisker demand results from the fact that foundries are out of stock as a result of close buying.

New York, July 3.—Specifications for foundry coke are unusually small, due to the fact most consumers are taking inventories. Improvement is expected after July 4. Spot sales of ordinary beehive foundry coke continue at $3.75 to $4.25, Connellsville, equivalent to $7.66 to $8.16, delivered, Newark, N. J. Premium brands of beehive foundry coke continue $4.85, Latrobe, Pa., equivalent to $8.56 delivered at Newark. Northern New Jersey by-product foundry coke continues $8.30, ovens, equivalent to $9 to $9.40, delivered at Newark. In New England the market on by-product foundry coke still is $11, delivered at representative consuming points.

Cincinnati, July 3.—Movement of coke in June was better than dealers had expected and they report tonnage as good as in May and almost up to April. Recent reductions brought out business that had been held back.

St. Louis July 3.—With practical completion of contracting for last half foundry coke requirements, activity is now confined to occasional spot sales. Deliveries continue satisfactory, by-product interests reporting a slightly larger movement than the average of the first half of June. Tonnages engaged for last half by melters in the West and Southwest total slightly under a year ago, which leads to belief considerable purchasing is to be done in that general area. On the other hand, reduced melt in the second quarter has left a heavier carryover than anticipated in the case of many users.

Birmingham, Ala., July 3.—Foundry coke contracts do not involve large tonnages, but current prices appear firm. The Tennessee Coal, Iron & Railroad Co. has all of its new batteries of by-product furnaces in operation. The Woodward Iron Co. is rebuilding its coke screening department. Foundry coke is $5.

Coke Prices

Beehive Ovens	
Prices per Net Ton	
Connellsville furnace	$2.60 to 3.00
Connellsville foundry	3.50 to 4.50
New River foundry	6.50 to 7.50
New River furnace	6.00
Wise county foundry	5.00 to 5.25
Wise county furnace	4.00 to 4.75
By-Product Foundry	
Newark, N. J., del.	9.00 to 9.40
Chicago, ovens	8.00
New England, del.	11.00
St. Louis	9.00
Birmingham	5.00
Indianapolis, del.	8.75
Ashland, Ky.	7.00
Portsmouth, O.	7.00
Detroit, ovens	8.50
Buffalo, ovens	9.00

Ferroalloys

Ferromanganese Stocks Hold Up Specifying Somewhat

New York, July 3.—Practically all consumers of ferromanganese now are under contract for their second half requirements. Sellers report $105, duty paid tidewater, has been named in all contracts and that consumers offered little resistance to this price, an advance of $5 over first half contract price.

Quite a few consumers specified heavily against first half contracts and thus have considerable stock of $100 metal. However, a number made no effort to stock, believing the $5 advance was not a sufficient consideration to justify them in departing from a policy of specifying material only as needed. Due to the fact, however, that there has been some accumulation of stocks against first half contracts, shipments of ferromanganese are expected to be much smaller in July and August than in May and June.

New Jersey Zinc Co. has blown in a second furnace on spiegeleisen, making two furnaces active on this metal at Palmerton, Pa. New orders for spiegeleisen are rather small due to the fact consumers generally are under contract but there have been some sales of spot carloads at the new price of $33, furnace, for 19 to 21 per cent. Specifications on contracts, however, are good and New Jersey Zinc Co. expects to be able to continue operating two furnaces. On 16 to 19 per cent spiegeleisen the asking price is $32, furnace.

Pittsburgh, July 3.—While consumption of ferroalloys has been slowing up in harmony with curtailed operations, it is true nevertheless that last half contracting has made considerable progress. Between 75 and 90 per cent of ferromanganese users here now are protected for the July-December period at $105, seaboard base. So far, specifications for July shipment have not materialized to any great extent nor will they until some stocks of $100 metal have been dissipated.

Ferroalloy Prices

Ferromanganese, 78 to 82 per cent tidewater, duty paid	$105.00
Ferromanganese, del. Pittsburgh	109.79
Spiegeleisen, 19 to 21 per cent domestic furnace	33.00
*Ferrosilicon, 50 per cent, freight allowed, carloads	83.50
*Do., less carload	88.50
Do., 75 per cent	130.00 to 150.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. per lb. con., del.	11.00
Do., for spot delivery	11.50
Ferrotungsten, stand., lb. cont.	96.00 to 98.00
Ferrovanadium, 30-40 per cent, per lb., contained, on analysis	3.15 to 3.65
Ferro-carbon-titanium carload, producers plant, net ton	200.00
Ferrophosphorus, per ton, carload, 17 to 19 per cent, Rockdale, Tenn., basis (18 per cent)	91.00
Ferrophosphorus, electrolytic, per ton, carload, 23-25% f.o.b. Anniston, Ala. (24 per cent)	122.50

*These prices contract; spot $5 higher.

Scrap

Softness Brings Decline of 50 Cents Generally—Users Taking Little Tonnage

ABSENCE of volume buying of iron and steel scrap is adding to weakness of all markets and decline has been general. Tonnage by water to Buffalo causes lower prices there. Railroad lists impend at Pittsburgh with reduced demand. Lake shipments of scrap are growing.

Chicago, July 3.—Iron and steel scrap prices continue to show a softening tendency in several lines. From 8000 to 10,000 tons of railroad material has been sold in the past few days, but not all the tonnage was for shipment into the Chicago district. Few holdup orders are reported and no distress tonnage appears on track. Melting steel continues at $12.50 to $13, with considerable dealer trading at $12.50 to $12.75. A sale of couplers and knuckles is reported at $14.25. Railroad malleable is slightly easier, the top price being $13. Both axle and machine shop turnings are slightly easier. A tonnage of railroad wrought has been sold as low as $11.50, net, on tracks.

Boston, July 3.—There was a decline of about 50 cents a ton in heavy melting steel during the past week, which resulted sympathetically with the situation at Pittsburgh and other markets. About the best price paid in the past week was $8.10 on cars, shipping point, so that the range was $7.75 to $8.10. Machine shop turnings also dropped about 50 cents a ton, to $4.75 to $5 on cars at shipping points to consumers. There was buying in the past week for blast furnace consumers at $5 to $5.50, but the tonnage involved was small.

Iron and Steel Scrap Prices

Corrected to Tuesday noon. Gross tons delivered to consumers, except Detroit where dealers' buying prices are shown

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	$10.25 to 10.50
Boston, dealers	7.75 to 8.10
Buffalo, No. 1	14.00 to 14.25
Buffalo, No. 2	12.00 to 12.50
Chicago	12.50 to 13.00
Cincinnati, deal	10.75 to 11.25
Cleveland, No. 1	13.00 to 13.50
Cleveland, No. 2	12.25 to 12.75
Detroit, No. 1	10.50 to 11.00
Eastern Pa.	12.50 to 13.00
Eastern Pa., No. 2	10.50 to 11.00
Bethlehem delivery	12.50 to 13.00
N. Y., deal., R. R.	9.25 to 9.85
N. Y. deal., yd.	6.25 to 6.50
Pittsburgh, No. 1	14.00 to 14.50
St. Louis, No.1	12.00 to 12.50
St. Louis, No. 2	10.50 to 11.00
Valleys, No. 1	14.25 to 14.75

COMPRESSED SHEETS

Buffalo	12.00 to 12.50
Chicago	11.00 to 11.50
Cleveland	12.50 to 12.75
Detroit	10.00 to 10.25
Pittsburgh	13.75 to 14.00
Valleys	13.75 to 14.00
E. Pa. new mat.	11.00 to 11.50

BUNDLED SHEETS

Buffalo	9.00 to 9.50
Cincinnati, deal	9.50 to 9.75
Cleveland	11.50 to 12.00
Eastern Pa.	9.50 to 10.00
Pittsburgh	12.75 to 13.00
St. Louis	7.75 to 8.25

SHEET CLIPPINGS, LOOSE

Chicago	7.50 to 8.00
Cincinnati	8.50 to 9.00
Detroit	7.00 to 7.50
St. Louis	7.75 to 8.25

STEEL RAILS, SHORT

Birmingham	11.50 to 12.00
Boston	8.50 to 9.00
Buffalo	16.00 to 16.50
Chicago	15.00 to 15.50
Cincinnati, deal	15.25 to 15.75
Detroit	11.00 to 11.50
St. Louis	15.50 to 16.00

STOVE PLATE

Birmingham	13.50 to 14.50
Boston, consumers	10.00
Buffalo	13.00 to 13.50
Chicago, net	11.50 to 12.00
Cinn., deal., net	8.00 to 8.50
Cleveland	12.00 to 12.50
Detroit, net	10.75 to 11.25
Eastern Pa.	11.00
N. Y., deal., mill.	6.75 to 7.00
Pittsburgh	11.50 to 12.00
St. Louis	11.50 to 12.00

SHOVELING STEEL

Chicago	12.50 to 13.00
Pittsburgh	9.75 to 10.00
St. Louis	10.50 to 11.00

KNUCKLES, COUPLERS SPRINGS

Buffalo	15.00 to 15.50
Chicago	13.75 to 14.25
Eastern Pa.	15.50 to 16.00
Pittsburgh	15.00 to 15.50
St. Louis	12.00 to 12.50

LOW PHOSPHORUS

Buffalo, billet and bloom crops	16.00 to 16.50
Cincinnati, deal	12.25 to 13.25
Eastern Pa.	17.50 to 18.50
Pitts. billet and bloom crops	18.50 to 19.00
Cleve. billet and bloom crops	17.00 to 17.50

FROGS, SWITCHES, GUARDS

Chicago	14.00 to 14.50
St. Louis	12.25 to 12.75

ANGLE BARS—STEEL

Buffalo	14.00 to 14.50
Chicago	14.50 to 15.00
St. Louis	11.75 to 12.25

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	9.50 to 10.00
Boston, dealers	9.00 to 9.50
Buffalo, No. 1	12.00 to 12.50
Buffalo, No. 2	14.25 to 14.50
Chicago, No. 1	12.30 to 12.90
Chicago, No. 2	12.50 to 13.00
Cinn., No. 1 deal.	9.75 to 10.25
Eastern Pa.	15.00 to 15.50
N. Y., No. 1 deal.	11.00 to 11.50
Pittsburgh, No. 1	10.50 to 11.00
Pittsburgh, No. 2	14.00 to 14.50
St. Louis, No. 1	9.50 to 10.00
St. Louis, No. 2	11.00 to 11.50

WROUGHT PIPE

Boston, dealers	7.00 to 7.50
Eastern Pa.	12.00 to 12.50
Buffalo	12.00 to 12.50
New York, deal.	8.00 to 8.50

YARD WROUGHT

Boston	8.00 to 8.50
Eastern Pa.	14.50 to 15.00

BUSHELING

Buffalo	12.00 to 12.50
Chicago, No. 1	11.00 to 11.50
Chicago, No. 2	8.50 to 9.00
Cinn., No. 1 deal.	10.00 to 10.50
Cinn., No. 2	5.50 to 6.00
Cleveland, No. 2	9.25 to 9.50
Pittsburgh, No. 1	12.00 to 12.50
St. Louis, No. 1	9.50 to 10.00
Detroit, mixed	7.25 to 7.50

MACHINE SHOP TURNINGS

Birmingham	8.00 to 9.00
Boston	4.75 to 5.00
Buffalo	8.25 to 8.75
Chicago	6.50 to 7.00
Cincinnati, deal	7.00 to 7.50
Cleveland	6.10 to 6.25
Detroit	5.00 to 5.25
Eastern Pa.	10.00
New York, deal.	6.00 to 6.60
Pittsburgh	9.00 to 9.25
St. Louis	7.00 to 7.50

MIXED BORINGS, TURNINGS
For blast furnace use

Boston, dealers	5.00 to 5.50
Buffalo	9.50 to 10.00
Cincinnati, deal.	7.75 to 8.00
Cleveland	9.25 to 9.50
Detroit	7.00 to 7.50
Eastern Pa.	9.50 to 10.00
New York, deal.	5.75 to 6.25
Pittsburgh	9.75 to 10.00

CAST IRON BORINGS

Birmingham, chem.	13.00 to 13.50
Birmingham, plain	8.00 to 9.00
Boston, chem.	9.50 to 10.00
Boston, dealers	5.25 to 5.50
Buffalo	9.50 to 10.00
Chicago	9.00 to 9.50
Cincinnati, deal.	7.75 to 8.50
Cleveland	9.25 to 9.50
Detroit	7.00 to 7.25
Eastern Pa.	10.50 to 11.00
Eastern Pa., chem.	14.50 to 15.00
New York, deal.	5.75 to 6.25
Pittsburgh	10.00 to 10.25
St. Louis	8.50 to 9.00
Valleys	13.50

PIPES AND FLUES

Chicago, net	8.50 to 9.00
Cincinnati, deal.	7.00 to 7.50
St. Louis	9.00 to 9.50

RAILROAD GRATE BARS

Buffalo	11.25 to 11.75
Chicago, net	11.25 to 11.75
Cincinnati	8.50 to 9.00
Eastern Pa.	11.50
New York, deal.	8.00 to 8.50
St. Louis	11.00 to 11.50

FORGE FLASHINGS

Boston, dealers	6.00 to 7.00
Buffalo	12.00 to 12.50
Chicago	9.00 to 9.50
Cleve., over 10 in.	11.75 to 12.25
Detroit	9.00 to 9.50
Pittsburgh	11.50 to 12.00

FORGE SCRAP

Boston, deal	5.50 to 6.00
Chicago	15.50 to 16.00
Eastern Pa.	11.00 to 11.50

ARCH BARS AND TRANSOMS

Chicago, net	19.50 to 20.00
St. Louis	18.75 to 19.25

Iron, Steel Works Scrap

AXLE TURNINGS

Boston, deal	6.75 to 7.00
Buffalo	12.00 to 12.50
Chicago	9.75 to 10.25
Cleveland	12.00 to 12.25
Eastern Pa.	12.00 to 12.50
Pittsburgh	12.50 to 13.00
St. Louis	9.50 to 10.00

STEEL CAR AXLES

Birmingham	17.00 to 17.50
Boston, ship. point	15.50 to 16.00
Buffalo	15.75 to 16.25
Chicago	17.65 to 18.20
Cleveland	16.00 to 16.50
Eastern Pa.	19.00 to 20.00
Pittsburgh	17.50 to 18.00
St. Louis	18.00 to 18.50

SHAFTING

Boston, ship. point	12.00 to 12.50
Chicago	17.35 to 17.90
Eastern Pa.	16.50 to 17.00
New York, deal.	14.00 to 14.50
St. Louis	16.50 to 17.00

Iron Foundry Scrap

CAR WHEELS

Birmingham, iron	12.00 to 12.50
Boston, con.	14.00 to 14.50
Buffalo, iron	12.25 to 12.75
Buffalo, steel	15.25 to 15.75
Chicago, iron	13.00 to 13.50
Chi., rolled steel	15.50 to 16.00
Cincinnati	11.50 to 12.00
Eastern Pa.	16.00
N. Y., iron, deal.	11.00 to 11.50
Pittsburgh, iron	14.00 to 14.50
Pittsburgh, steel	15.00 to 15.50
St. Louis, iron	13.00 to 13.50
St. Louis, steel	13.25 to 13.75

NO. 1 CAST SCRAP

Birmingham, cup.	14.00 to 14.50
Boston	14.00 to 14.50
Boston, textile	13.25 to 13.50
Buffalo	14.25 to 14.50
Chicago, machiny.	15.95 to 16.50
Chicago, railroad.	14.30 to 14.85
Chicago, agri.	14.00 to 14.55
Cincinnati, mach. cupolas, net deal.	14.50 to 15.00
Cleveland, cupola	15.50 to 16.50
Detroit, net	12.25 to 12.75
Eastern Pa. cupola	16.00
N. Y., cup., deal.	13.00 to 13.50
Pittsburgh, cupola	14.00 to 14.50
San Fran., del.	20.00 to 21.00
Seattle	14.50 to 15.00
St. Louis, railroad	13.00 to 13.50
St. Louis, agri.	13.00 to 13.50
St. Louis, machy.	13.00 to 13.50
Valleys	16.50 to 17.00

HEAVY CAST

Boston	10.50 to 11.00
Buffalo, breakable	11.50 to 12.00
Cleve., breakable	12.25 to 12.50
Detroit, auto., net	20.00 to 21.00
Detroit mach., net	12.75 to 13.25
Eastern Pa.	14.50 to 15.00
New York, deal.	11.50 to 12.00
Pittsburgh	12.00 to 12.50

MALLEABLE

Boston, railroad	13.50 to 14.50
Buffalo	15.00 to 15.50
Chicago, agri.	11.75 to 12.25
Chicago, railroad	12.50 to 13.00
Cinn., R. R., deal.	12.00 to 12.50
Cinn., agri., deal.	11.75 to 12.25
Cleveland, agri.	15.00 to 15.50
Cleveland, rail.	15.50 to 16.00
Detroit, auto	14.50 to 15.00
Pittsburgh, rail.	14.00 to 14.50
St. Louis, agri.	11.50 to 12.00
St. Louis, rail.	11.50 to 12.00

Miscellaneous Scrap

RAILS FOR ROLLING
5 feet and over

Birmingham	11.50 to 12.50
Boston, dealers	9.50 to 10.00
Buffalo	14.25 to 14.75
Chicago	14.50 to 15.00
Eastern Pa.	14.50 to 15.00
New York	11.00 to 11.50
Pittsburgh district	16.00 to 16.50
St. Louis	13.00 to 13.50

LOCOMOTIVE TIRES

Chicago, No. 1	13.50 to 14.00
Chicago, cut	15.50 to 16.00
St. Louis, No. 1	11.75 to 12.25

LOW PHOS. PUNCHINGS

Chicago	14.00 to 14.50
Pittsburgh	16.50 to 17.00

New York, July 3.—Following a reduction of 50 cents a ton on mixed borings and turnings, clean cast borings and railroad steel for shipment to various eastern plants of the Bethlehem Steel Corp., a leading dealer here has made a similar reduction in his buying prices on these grades. This interest is now quoting $9.25 to $9.85, New York, on railroad steel and $5.75 to $6.25 on mixed borings and turnings, and on clean cast borings. The market generally is settling to these levels. Skeleton steel is down. Other grades are unchanged with general consuming demand slack.

Philadelphia, July 3.—Following heavy business of the preceding week iron and steel scrap have been quiet. Current business has been scattered tonnages accompanied by further price reduction.

Buffalo, July 3.—Large receipts of heavy melting steel from other lake ports continue to depress the Buffalo market although prices show no further recession. Yard operation will be low this week, due to hold orders from several consumers.

Pittsburgh, July 3.—Scrap shows few signs of life. The Pennsylvania July list aggregates about 40,000 tons, the Pittsburgh & Lake Erie, Baltimore & Ohio and others, being of their usual size. Open market transactions between dealers and mills are confined to small amounts which they have or are able to pick up, on which they quote attractive prices. Occasionally the Monessen, Pa., Weirton, W. Va., or other mills buy heavy melting steel at $14 to $14.50 but this grade, particularly in first class material, is scarce and tonnage would cause an advance.

Cleveland, July 3.—Conditions are quiet in iron and steel scrap. The market lacks strength, but no further reductions have been made in prices. Offerings are fairly large, but consumers' stocks in a number of instances preclude active buying. Blast furnace scrap continues at $9.25 to $9.50, with heavy melting steel quoted at $13 to $13.50.

Cincinnati, July 3.—Slow demand has resulted in further decline in prices of several items. The lower level is 25 to 50 cents under former prices. Buying has not been stimulated by the drop, though some scrap has moved.

St. Louis, July 3.—Continued dullness and further decline in prices feature the market for iron and steel scrap. Except for a few items to use for mixtures and to melt forthwith, buying is virtually at a standstill. Offerings are heavy and dealers are experiencing difficulty in placing the material coming into sight. In the immediate past some distress scrap has been in evidence, and mills and foundries are more discriminating in quality, though relatively few rejections are reported.

Birmingham, Ala., July 3.—Some items of iron and steel scrap are somewhat more active than they have been, and No. 1 cast, heavy melting steel and stove plate have been selling fairly well. Prices are nominally unchanged.

Toronto, Ont., July 3.—Trading in iron and steel scrap in Toronto and Montreal markets has shown little change. While much of the interest centers around scrap for immediate delivery, a few buyers have come forward with contracts covering third quarter needs. Tonnages involved in business of the week was somewhat better than those of the three of four weeks previous, but individual orders were mostly in limited tonnage. Montreal dealers report a growing demand for iron and steel axles. Despite prevailing high price for these lines little is coming out and a shortage prevails in some districts.

In the Toronto market dealers are offering $13.50 to $14 for steel axles and $15.50 to $16 for iron axles. Most of these grades are for shipment to the Montreal market, which at the present time commands not only higher prices but also a stronger resale demand. Hamilton, Ont., mills are showing interest in the market and have contracted for heavy melting steel and turnings.

Canadian Scrap

Dealers' Buying Prices

MONTREAL

Per Gross Ton

Iron axles	$22.00
Steel axles	20.00
Car wheels	16.00
Stove plate	13.00
Wrought pipe	5.00
Turnings	5.00
Heavy melting steel	7.00

TORONTO

Steel axles	13.50 to 14.00
Iron axles	15.50 to 16.00
Heavy melting steel	8.00 to 8.50
Turnings	6.50 to 7.00
No. 1 mach. cast (net)	14.50 to 15.00
Malleable, (net)	12.50 to 13.00
Stove plate (net)	8.50 to 9.00

Weirton Operating Full

Weirton, W. Va., July 3.—The Weirton Steel Co. next week will round out six months of 100 per cent operations in its open-hearth department. Work has started on its twelfth furnace to be completed by the end of this year.

As water pressure increases, steam bubbles decrease in size; at 3200 pounds pressure, water passes into steam with no boiling.

Semifinished

Specifications Better — Mills Seeking to Restore Former Price Levels After Recent Drop

PRICES of sheet bars, billets and slabs are not clearly defined, following a dip of $1 a week ago. Efforts now are being made to restore the former levels, and while sheet bars were sold at $32, the minimum now appears to be $33, and some makers are holding to $34. Mills are again seeking to obtain $33 for billets and slabs. Wire rods prices show weakness.

SEMIFINISHED STEEL PRICES PAGE 32

New York, July 3.—On wire rod requirements for the third quarter, such contracts as have been placed have been booked at $42, base, Pittsburgh. Wire rod contracts which previously had been booked at $44 generally have been marked down to $42. Consumption of wire rods in this territory continues fair.

American mills, after booking heavy tonnages of wire rods for shipment to Japan, have advanced their price on wire rods for exports with the result that further Japan wire rod business at this time is going with European producers.

Pittsburgh, July 3.—Semifinished steel specifications are heavier. Demand from nonintegrated sheet mills has been slightly better than it was for several weeks and while some were able to obtain their sheet bars for as low as $32, the minimum now seems to be $33 and some makers are firming up to a $34 basis. Effort to restore the $33 price on 4 x 4-inch rerolling billets after a temporary dip to $32 has become more widespread. The same is true of 2 x 8-inch slabs on which $33 is quoted for third quarter. Forging billets are $38, and specifications lately have been slightly more numerous. While wire rods still are quoted at $44, in some directions this price has sagged back to $42.

Cleveland, July 3.—Specifications received by the leading local merchant producer of semifinished steel is enabling it to continue operations at 100 per cent. Contracts have been renewed with regular customers for third quarter. Billets and slabs are $32 to $33, Cleveland, Youngstown or Pittsburgh, and sheet bars $32.50 to $33.

Chicago, July 3.—Mills report the semifinished market steady and showing no reflection of the reported weaknesses in the East. Forging billets range from $38 to $43, Chicago, according to grade. Rerolling billets, 4 x 4-inch base, are $34, Chicago.

Youngstown, O., July 3.—While the recent announcement of new quotations on billets and sheet bars for third quarter named $33 for sheet bars and $32 for slabs and billets, not a great deal of tonnage has been contracted. This may be because it was known the independent sheet mills in this district would close generally during this week.

The Market Section

Bars

Apathy Marks Third Quarter Buying—Mills Seek to Hold Prices Steady

BUYERS and sellers of soft steel bars are jockeying on third quarter business and the result is a market confined to spot buying. Mills seek to hold prices while buyers are resisting and asking lower figures. Deliveries at Pittsburgh are prompt and at Chicago much closer than formerly. Business generally is above the weekly average for the year.

BAR PRICES, PAGE 31

Chicago, July 3.—Little inclination is seen on the part of mills to take finished steel bookings for third quarter, and from buyers to seek protection for that period. One producer actually has refrained from naming a third quarter price, but has closed a few contracts on the basis of 2.00c, Chicago. Another mill has definitely named 2.00c as the quarter's price. The only consumer interest in contracting is from buyers whose requirements for the coming weeks can be definitely measured by orders at hand. The end of the half year finds specifications for bars, plates and shapes above the weekly average for this month and fully up to shipments. The half year, it is believed, will approach a record for first half steel shipments, and some estimates place this activity fully 10 per cent above last year's first half, despite the fact that June shipments declined slightly. Demand for bar mill and like products is steady. The automotive parts industry in the West is holding well to the average activity for the year. Bar mill operations are slightly above 80 per cent. Deliveries are running three to four weeks, depending upon sizes and sections ordered. Roll changes are more frequent.

As to the 2.00c price for soft steel bars, producers state that the present volume of new business hardly offers a real test of price strength. Rail steel bar mill operations continue at full double turn, with the price at 1.90c, Chicago Heights, for third quarter. Bar iron is steady at 2.00c, Chicago.

Pittsburgh, July 3.—Merchant steel bar mills show no anxiety at lack of contracting for third quarter. Farsightedness on their part may see the justification for the 1.90c figure they are quoting for that period but users cannot and are resisting efforts to charge more than 1.85c. Some want an even lower figure than they paid during second quarter, so that buying may for a time be strictly spot market transactions. Merchant steel bar deliveries are promptly available In the meantime, 1.85c to 1.90c, is the quotable market.

Refined iron bar orders are still for prompt needs only. Customers specify small quantities at prices all the way from 2.75c to 4.00c.

Cleveland, July 3.—Soft steel bars present a mixed situation. Local mills have booked some business at the unchanged level of 1.85c, Cleveland mill. One Pittsburgh district producer has closed a fair number of contracts at 1.90c, Pittsburgh. Still other makers have not actively pressed contracting. It is thought that within a few days the price situation will clarify. June bar sales of most sellers fell only a trifle short of the May total. Cleveland district bar mills are running full.

Philadelphia, July 3.—A number of consumers have contracted for third quarter steel bars, usually at 1.90c, Pittsburgh, though some unusually important users have received 1.85c.

Sheet and Tin Plate Mill Wages Unchanged

Youngstown, O., July 3.—Sheet and tin plate mill wages will continue unchanged in July and August, at the same level that has prevailed since Jan. 1. The average sales price of No. 26, 27 and 28 gage black sheets reported by mills having contracts with the Amalgamated Association of Iron, Steel and Tin Workers was 3.00c in May and June. Wages remain 25½ per cent above base. Following are comparisons of price averages for the periods designated:

May-June	3.00c	unchanged
March-April, 1928	3.00c	unchanged
Jan.-Feb.	3.00c	unchanged
Nov.-Dec.	3.00c	—3 per cent
Sept.-Oct.	3.10c	+3 per cent
July-Aug.	3.00c	unchanged
May-June	3.00c	unchanged
March-April, 1927	3.00c	—3 per cent
Jan.-Feb.	3.10c	—4½ per cent
Nov.-Dec.	3.25c	unchanged
Sept.-Oct.	3.25c	unchanged
July-Aug.	3.25c	unchanged
May-June	3.25c	unchanged
March-April	3.25c	+1½ per cent
Jan.-Feb., 1926	3.20c	+3 per cent

Plates

Market Is Untested, Though Some Good Tonnages Are Developing

CONTRACTING for plates for third quarter appears limited to fabricators' known requirements, and prices are not being fully tested. Indications of a larger volume of business are noted at Chicago and Pittsburgh. Three oil tank projects up for bids require 14,000 tons of plates. A fleet of barges for government service will take 5000 tons.

PLATE PRICES, PAGE 31

New York, July 3.—The contract for fabricating 4000 tons of ½-inch plates for 21,000 feet of 60-inch pipe to be built in the Borough of Queens for New York department of water supply, gas and electricity has been reawarded, going to Penstock Construction Co., Sharon, Pa. The contract previously had been awarded to Walsh's Steam Boiler Works, Holyoke, Mass. Contractors for the erection of this line are Wilcox & Stutz Inc., Brooklyn. Another pipe line awarded by New York department of water supply is to be erected in the Bronx by Anthony Cianciulli. The contract for fabricating the steel plates for this line has been awarded to East Jersey Pipe Co., Paterson, N. J., and 1400 to 1500 tons of plates for this job will be furnished by the Carnegie Steel Co. Gulf Refining Co. is expected shortly to inquire for several oil storage tanks to be erected on Staten island. The Central Iron & Steel Co., it is understood, will furnish the plates to be used by Virginia Bridge & Iron Co. in building 1000 car bodies for Virginian railroad.

Considerable comment is heard here over the low prices which eastern mills named on the New York Central railroad's inquiry for plates. The Central Iron & Steel Co. quoted 1.85c, Newberry Junction, Pa., equivalent to 1.695c, mill. Lukens Steel Co. quoted 1.90c, Newberry Junction, equivalent to 1.71c, mill.

Pittsburgh, July 3.—Developments are expected rapidly in the plate market now that railroad car lettings and other projects are better. Large pipe lines will help out the skelp and plate mills. A fleet of 32 or 35 barges for the United States engineers at Memphis, Tenn., or Vicksburg, Miss., will take approximately 5000 tons. Large lots of oil tanks are scheduled to be bought in the East. Mills continue to quote 1.90c for third quarter contracts but customers are indifferent.

Chicago, July 3.—Three projects from oil territory in the South and Southwest call for 14,000 tons of plates, and at least one mill in this territory will figure on all or part of the tonnage. Bids were received for

the 12,000 tons for the Denver water line July 1. Specifications for plates from small tank makers and general manufacturing lines at the close of the second quarter reached a high mark. Plate mill operations are slightly under 80 per cent and are tapering. The price of 2.00c, Chicago, has been named for third quarter by one producer, but it is understood practically no forward business has been placed except to cover actual requirements of buyers at the present time.

Cleveland, July 3.—Plate mills have not actively pressed third quarter contracting, though professing a 1.90c, Pittsburgh, price as the level at which they will solicit. Meanwhile, spot needs of users have been closed at 1.85c. Plates lack some of the strength manifested by bars. June sales fell short of May with most sellers.

Philadelphia, July 3.—Eastern platemakers in some instances have extended second quarter contracts through third quarter. The present price is 1.90c, base, Pittsburgh, or 2.05c, Coatesville, depending on which takes the lowest delivered price.

CONTRACTS PLACED

540 tons, four additional sand and gravel barges, Keystone Sand & Supply Co., Pittsburgh, to Dravo Contracting Co.
200 tons, Weyerhaeuser lumber mill burners, Longview, Wash., to Barde Steel Co.

CONTRACTS PENDING

5000 tons, 32 or 35 barges for United States engineers, Memphis, Tenn., or Vicksburg, Miss.; bids about to be asked.
250 tons, two deck barges, 120 x 30 x 7 feet, United States Engineers, New Orleans; bids close July 16.
200 tons, water tank, Kingsport, Tenn.; Pittsburgh-Des Moines Steel Co. low bidder.

Refractories

Ford and Weirton are Providing Moderate Activity

REFRACTORIES PRICES, PAGE 32

Pittsburgh, July 3.—Most refractory orders are limited sized lots for repairs to open-hearth, blast or other furnaces, or an occasional complete blast furnace lining. One of the latter is up for Ford Motor Co., Detroit. Brick for Weirton Steel Co.'s new 250-ton open-hearth furnace will be bought shortly; 300,000 silica, 300,000 each first and second quality fire clay, with some chrome and a small quantity of magnesite brick. The by-product coke plant projected for Neville island by Sharpsville Furnace Co. is understood still to be in the engineering stages. Most silica brick makers, while encountering intermittent price cuts, are inclined to maintain $43, and the same policy holds for fire brick makers.

Pipe

Line Pipe Activity Revived with Several Heavy Lettings—Cast Approaching Seasonal Dullness

REVIVAL of line pipe activity created a sudden stir in the tubular market in the past week. Texas Co. awarded 65,000 tons and Atlantic Refining Co. 50,000 tons. In addition several lines are actively contemplated. Standard merchant pipe demand from jobbers is not as heavy as expected. Cast pipe is approaching the summer dullness with prices firm.

PIPE PRICES, PAGES 32, 72

Pittsburgh, July 3.—Sudden revival of oil and gas line pipe business is the feature of the tubular goods market and presages a somewhat active last half. The trade understands that a large number of projects, each involving several million dollars, will now be pushed to conclusion. An order for about 65,000 tons was placed with the Youngstown Sheet & Tube Co. last Friday by the Texas Co. for its 470-mile line from west Texas to Houston, Tex. This will be all welded material and comprises a main line of 175 miles of 12-inch, together with tributary lines of 10, 8, 6 and 4-inch. It will cost in the neighborhood of $13,000,000.

Atlantic Refining Co., through its subsidiary the Atlantic Pipe Line Co., has placed an order with National Tube Co. for 50,000 tons, consisting of 500 miles of 10-inch from its tank farm at Midland, Tex., to its terminal at Atreco on the Gulf coast, for immediate delivery.

Hope Engineering & Supply Co. will construct a 136-mile gas line from West Virginia to Kentucky for Inland Gas Corp., understood to have a contract to supply fuel to American Rolling Mill Co. at Ashland, Ky. This line will be either 12, 14 or 16-inch, probably the latter, in which event approximately 25,000 tons will be bought.

Action is deferred until later in the year on the 450 miles of 22 or 24-inch line for the Standard Oil Co. of New Jersey from Mobile, Ala., for which Ford, Bacon & Davis are engineers. This, it is understood, will involve approximately 150,000 tons.

Standard full weight merchant pipe demand is spasmodic. Jobbers are not turning over as much as they thought they would in view of the widespread building program. Each order is small in view of prompt deliveries. Operations are averaging around 50 or 60 per cent, with some lapweld departments on a 40 per cent basis and some buttweld departments as high as 70 per cent. Wrought iron pipe operations average fairly good.

Demand is fairly steady from the automotive industry for seamless tubes but orders from other consuming lines are poor. Prices are firm on the bases inaugurated a week or two ago.

New York, July 3.—Cast pipe demand is quiet, with prices unchanged, but fairly firm considering conditions. Aside from 1100 tons or so of pipe and special castings for this city recently noted as pending, little municipal demand is noted.

New York Power & Light Corp., Albany, N. Y., is inquiring for buttwelded pipe for a gas line. The inquiry involves 23 miles of 6⅝-inch pipe and 13 miles of 8⅝-inch pipe. A large order for gas pipe for shipment to Japan just has been placed with American mills but no particulars have been divulged. An important tonnage of pipe for a domestic oil transportation line is expected to materialize shortly.

Boston, July 3.—Tonnage sought by Massachusetts amounted to 300 tons of 16-inch pipe rather than the 4000 tons reported a week ago, but as yet this contract has not been awarded. Private business is decidedly off, seasonably natural. Improvement is not looked for until the latter part of July, when buying by municipalities will start up to meet their requirements for fall work. Prices for small pipe hold firm, while concessions are still obtainable on the larger sizes, 16 inches and up.

Chicago, July 3.—No definite seasonal slump is being shown in the buying of cast iron water pipe through contractors, although large municipal projects are infrequent. Backlogs of producers are somewhat spotty, but most foundries are booked 15 to 30 days or more ahead. Several producers report June business unusually good and approaching a record for that month. The half year's volume is only slightly under normal. Railroad buying is active. Santa Fe has bids in for 20,000 feet. National Cast Iron Pipe Co. closed on 2500 tons of 6 to 24-inch pipe for Roseville, Mich. Prices are steady at $31 to $33, base Birmingham, for 6 to 24-inch.

Birmingham, Ala., July 3.—Considerable more activity is noted in the cast iron pressure pipe market, several of the shops operating near capacity. Shipments are good. Quotations are maintained above $31 for 6-inch and over sizes, with less than car lots bringing $33. Few lettings have been received from the East.

CONTRACTS PLACED

2500 tons, 6 to 24-inch pipe for Roseville, Mich., to National Cast Iron Pipe Co.

750 tons, 6 to 12-inch pipe for West Allis, Wis., to United States Cast Iron Pipe & Foundry Co.
660 tons, 8-inch centrifugal pipe for water improvement projects, Seattle; to United States Cast Iron Pipe & Foundry Co.
500 tons, 12-inch pipe for Yonkers, N. Y., to United States Cast Iron Pipe & Foundry Co. at $37.50, f.o.b.
500 tons, 6 to 8-inch pipe for Columbia, Ill., to McWane Cast Iron Pipe Co.
321 tons, 4 to 10-inch class B pipe, Holtville, Calif., to Gateway Concrete Pipe & Products Co.
125 tons, 6 to 8-inch pipe for Dayton, O., to United States Cast Iron Pipe & Foundry Co.
115 tons, 8 to 20-inch centrifugal pipe, Seattle, to United States Cast Iron Pipe & Foundry Co.

CONTRACTS PENDING

3075 tons, 8, 12 and 6-inch pipe and 145 tons of fittings for District of Columbia commission, Washington; bids July 11; 300 tons, fire hydrants, bids in July 10.
3000 tons, 3079 tons, 24-inch cast pipe for West Purley, N. Y.
500 tons, 8-inch pipe for Bloomfield, N. J.; bids in.
300 tons, approximately, department of water supply, New York; Warren Foundry & Pipe Co. low bidder at $39, delivered yards.
259 tons, 6 to 12-inch class D pipe for Nevellie township, Pa.; bids July 5.
102 tons, 4 and 6-inch class B, improvement of Market street, San Diego, Calif.; bids opened.
100 tons, 6 and 8-inch pipe for Borough of Highland Park, N. J.; bids in.
Unstated tonnage, 20,000 feet, 6 to 8-inch pipe for Santa Fe railroad; bids in.
Unstated tonnage, ten miles of 6 to 16-inch pipe for Mt. Pleasant, N. Y.; general contractors' bids in July 18.

Tin Plate

Export Orders Larger at Higher Prices—Domestic Demand Heavy

TIN PLATE PRICES, PAGE 31

New York, July 3.—Tin plate makers continue to operate full as a result of continued heavy specifications. September is the earliest shipment independent producers can give on export orders, and the only exception is the United States Steel Products Co. which has booked tin plate business for shipment abroad in July. Current prices for export have shown a tendency to advance and the American mills now are getting substantially 15 cents a base box higher on their foreign sales than recently. Despite the advance in export prices, orders are coming in constantly for the reason that the English price for export is higher than the American. Sales of stock list tin plate to the domestic trade continue to bring $4.65 to $4.75 and $4.90 to $5, per base box, Pittsburgh.

Pittsburgh, July 3.—Tin plate specifications remain high and shipments correspondingly heavy, although from now on they will commence to taper off from the high records maintained all year to date. Operations continue to average 90 to 95 per cent. Container manufacturers are confident this year's can consumption will be heavier than ever before and consequently are making up a large number of cans.

Credit to Joseph Nason is given by the engineering profession for the development of the globe-type valve; it was introduced in 1845.

Sheets

Smaller Mills Show Firmer Price Tendency—Specifications Good —Mills Extend Holiday

SHEET purchases are of a routine character, with demand from the automotive industry fairly active. Specifications during the closing week of June were especially satisfactory. Prices do not show much variation from levels prevailing for several weeks, although some of the smaller producers are showing more firmness. Mills will be closed for a few days beyond July 4 for repairs.

SHEET PRICES, PAGE 31

Youngstown, O., July 3.—Due to July 4 coming in the middle of the workweek and making mill operation unprofitable and generally unsatisfactory, the independent sheet mills in this district are taking advantage of the opportunity to close down for needed repairs. Some plants such as the Newton Steel, while reluctant to close even for a few days because of the insistent demand for shipments from makers of auto parts, have not had as favorable an opportunity as the present to overhaul equipment. So it is with the Deforest plant of the Republic Iron & Steel Co. which has been running steadily for months. However, all these mills will start up next Sunday midnight or early Monday with a good week's operations assured. Sales of the various sheet grades continue at a routine rate. Common black may be had in large tonnages down to 2.65c, Pittsburgh, with carloads bringing 2.75c and higher. Blue annealed seems to be pegged at 2.00c as minimum with valley mills, ranging up to 2.10c. Demand for galvanized is no heavier and district mills hold to 3.65c as minimum, ranging up to 3.75c as maximum on carloads. Full-finished autobody sheets are firm at 4.00c.

New York, July 3.—No general third quarter buying movement has developed in the sheet market, although some contracts have been closed. Prices show little change. On black sheets the usual figure is 2.65c, base, Pittsburgh, for cold rolled, one pass, while on black sheets more highly finished the usual base is 2.70c. Blue annealed prices range from 2.00c to 2.10c, base, Pittsburgh. Galvanized sheets are 3.50c, base, Pittsburgh, while the usual differential is allowed to those buyers who are in the class of jobbers or distributors. Sheet demand continues good.

Export prices of American sheets have been advanced about $1 a gross ton, making them $3 higher than European export prices.

Pittsburgh, July 3.—Some of the smaller sheet producers are taking a firmer view of prices. Quotations, however, are just about where they were a week ago, with more black tonnage being booked at 2.70c than at 2.65c. Little galvanized is available at below 3.50c, except some off quality roofing material on which as low as 3.40c, base, was done. Blue annealed again has sold at 2.00c. Some makers continue to adhere to 2.10c but are booking only small amounts. Additional attractive business has been placed by automotive consumers of full finished sheets in Michigan and elsewhere at 4.00c. The volume of specifications during June was satisfactory, and in the final week almost every consuming line participated. For some interests, June shipments were so heavy that the total for the first half of the year was brought to a basis favorably comparable with any first half on record. The American Sheet & Tin Plate Co. operated at 73 per cent last week, but is not doing that well this week owing to the holiday shutdown which probably will extend beyond July 4 to permit of making necessary inspections, repairs and roll adjustments. Average sheet mill operation has been about 70 per cent.

Chicago, July 3.—No pickup is noted in the sheet market. Black and galvanized continue weak, while order departments have backlogs of three to four weeks on blue annealed. The bottom Chicago delivered prices are 2.80c for No. 24 black; 3.65c for No. 24 galvanized; and 2.15c for No. 10 blue annealed.

St. Louis, July 3.—Fairly steady improvement in the sheet market since the third week in June is reported by producers and distributors. Needs neglected earlier in the season now are being covered, and some inquiry for third quarter is appearing.

Philadelphia, July 3.—Steel mills generally are not urging consumers to place third quarter contracts, and in some instances they are actually discouraging them from such action. They prefer to book current orders.

Cleveland, July 3.—Unexpected vitality of demand has shifted the topic of discussion away from prices a little in the sheet market the past week. Although no definite improvement in either prices or buying has taken place, sentiment is better than for several months. Several full finished mills have sufficient bookings to maintain a high operating rate into August. Autobody grades are firm at 4.00c, Pittsburgh, and metal furniture stock at 3.80c to 3.90c, Pittsburgh. Strength in blue annealed is more noticeable, and although 1.85c still is quoted, more effort to obtain 2.00c, on the part of jobbing mills is noted. Black sheets continue soft at 2.70c, valley or Pittsburgh base, with galvanized at 3.45c to 3.50c.

Structural Shapes

Midsummer Lull Approaches but Awards Continue Heavy for Season—Third Quarter Prices Still Being Resisted

AWARDS and inquiries for structural steel in the past week reflected the tendency of early summer dullness. The largest award was for 6000 tons for a power plant in New Jersey and the heaviest inquiry involved 12,000 tons for the Western Union building in New York. Bridgework continues a leading factor in the fabricated structural market.

Prices remain unestablished in the plain structural market. Although 1.90c, Pittsburgh, and 2.00c, Chicago, have been named for third quarter, fabricators and other large consumers balk at the increase over second quarter quotations. Some contracts are reported renewed at the second quarter, 1.85c, Pittsburgh, level. Fabricated prices are wobbly.

STRUCTURAL SHAPE PRICES, PAGE 31

New York, July 3.—Structural demand is moderately good with several fair sized jobs placed and newly pending. Bids will be opened this week on foundation work for the Kill van Kull bridge which eventually will require many thousand tons of steel. Schoolwork is prominent with 3500 tons for a high school in Brooklyn out for bids. Prices virtually are unchanged.

Considerable comment was heard the past week over low prices which eastern mills quoted on the New York Central inquiry on shapes. Phoenix Iron Co. quoted 1.90c, base Newberry Junction, Pa., equivalent to 1.70c, mill, on plain structural material.

About 500 to 1000 tons of sheet steel piling will be required for the Kill van Kull abutments to connect Bayonne, N. J. and Port Richmond, Staten Island, N. Y.

Boston, July 3.—Few large contracts in structural were placed during the past week, but an extensive amount of small tonnage came into the market. Fabricated prices are soft. Bridge building continues active and within a fortnight the Boston & Maine railroad is expected to award 3000 tons for bridges at Saco, Me., Salmon Falls, N. H., and Haverhill, Mass.

Philadelphia, July 3.—Fair structural shape bookings were noted in this territory in the past week but prices still cover a wide range. The tendency is to quote prices equivalent to 2.01c to 2.11c, delivered Philadelphia, but lower prices have not yet disappeared.

Pittsburgh, July 3.—Structural shape mills believe that if they can hold their quotation for a few weeks more enough business will have developed to substantiate the 1.90c figure which they quote for third quarter. Contracting for that period has made no progress, buyers resisting the $1 advance. Mills have not been aggressive in seeking third quarter contracts and consumers apparently are resigned to obtaining their tonnage requirements in the spot market. Not a few are well equipped with material gathered in on second quarter 1.85c contracts. Awards this week have been disappointing. A group of local fabricators report their total tonnage for the week as about 900 tons. This week the 14,000-ton Louisville, Ky., bridge is scheduled for letting.

Cleveland, July 3.—Lack of specific awards and inquiries continue to hamper fabricating operations in this district. A number of plain material contracts have been made on the basis of 1.90c, Pittsburgh, mills reporting that second quarter business has bee cleaned off the books. Specifications the last week of the quarter were good. No action has been taken as yet on the bridgework for the Nickel Plate and New York Central roads requiring several thousand tons.

Chicago, July 3.—About 8000 tons of new structural steel inquiry has developed in western territory, including a 4200-ton bridge project for the Texas & Pacific railroad in Louisiana. Fabricators are making no effort to build stocks of plain material and are coming into the market for steel to cover actual projects in sight. The second quarter finished with brisk specifications from fabricators whose operations in the district average 70 to 75 per cent. The 2.00c, Chicago, price for plain material, named by one interest for third quarter, is virtually untested on forward requirements.

Awards Compared

	Tons
Awards this week	**34,197**
Awards last week	**32,596**
Awards two weeks ago	**73,597**
Awards this week in 1927	**29,450**
Average weekly awards, June	**45,089**
Average weekly awards, 1928	**39,088**
Total awards to date, 1927	**923,754**
Total awards to date, 1928	**1,016,295**

CONTRACTS PLACED

6000 tons, power plant, Deepwater, N. J., to McClintic-Marshall Co.

3700 tons, power house for Duke Power Co., Mt. Holley, N. C., to Ingalls Iron Works Co.

2500 tons, assembly plant for Chevrolet Motor Co. at Kansas City, Mo., to Kansas City Structural Steel Co.

2000 tons, fire insurance building, Philadelphia, to American Bridge Co.

1500 tons, Marshall Field welfare apartments, Chicago, to Duffin Iron Co., previously reported to American Bridge Co.

1333 tons, factory building for Chrysler Corp., Detroit, to Russell Wheel & Foundry Co.

1200 tons, bridge over Missouri river, to Wisconsin Bridge & Iron Co.

1100 tons, two coal washer buildings, for Pittsburgh Coal Co., Pittsburgh, to Pittsburgh Engineering Co.

1040 tons, New York Central railroad passenger station, South Bend, Ind., to McClintic-Marshall Co.

1000 tons, theater, Brooklyn, N. Y., to Hedden Iron Construction Co.

1000 tons, Boston & Maine railroad bridges, to Boston Bridge Works Inc.

1000 tons, Drayton Mills, Spartanburg, S. C., to Carolina Steel & Iron Co.

935 tons, steel foundry building, East St. Louis, Ill., to McClintic-Marshall Co.

800 tons, Reading railroad station, Huntington street, Philadelphia, to McClintic-Marshall Co.

700 tons, Crescent temple, Trenton, N. J., to American Bridge Co.

660 tons, Girard college building, Philadelphia, to American Bridge Co.

645 tons, Drexel college building, Philadelphia, to American Bridge Co.

575 tons, Pennsylvania railroad cold storage building, Jersey City, N. J., to Belmont Iron Works.

520 tons, soaking pit building for Ford Motor Co., Detroit, to Massillon Bridge & Structural Co.

500 tons, bridge for St. Louis & Southwestern railroad, Garland City, Ark., to Virginia Bridge & Iron Co.

500 tons, trestle and headframe for Montreal Mining Co., Ironwood, Mich., to Worden-Allen Co.

500 tons, Pennsylvania railroad building, Jersey City, N. J., to Belmont Iron Works.

500 tons, Fulton bank building, Lancaster, Pa., to Shoemaker Bridge Co.

500 tons, professional building, East Sixty-first street, New York, to unstated fabricator.

450 tons, clinker storage warehouse, Pacific Coast Cement Co., Seattle, to Wallace Bridge & Structural Steel Co.

400 tons, Latonia theater, Oil City, Pa., to Jones & Laughlin Steel Corp.

300 tons, bus terminal and office building for Wisconsin Power & Light Co., Madison, Wis., to Worden-Allen Co.

300 tons, bus garage, White Plans, N. Y., to Belmont Iron Works.

270 tons, addition to Dollar building, San Francisco, to Judson-Pacific Co.

265 tons, shelter platforms and enclosures, Broad street station, Pennsylvania railroad, Philadelphia, to McClintic-Marshall Co.

255 tons, three miscellaneous jobs, including Strunz bakery, Pittsburgh, to Jones & Laughlin Steel Corp.

250 tons, miscellaneous steel for hydroelectric plant, for Phoenix Utility Co. at Waterville, N. C., to Ingalls Iron Works Co.

250 tons, Baltimore & Ohio railroad bridges, to American Bridge Co.

250 tons, loading dock for Chrysler Corp., Detroit, to Russell Wheel & Foundry Co.

230 tons, Public Service Gas & Electric building, Newark, N. J., to Belmont Iron Works.

200 tons, state bridges, Vermont, to Bethlehem Steel Co.

200 tons, plant building for U. S. Splicing Machine Co., Chicago, to American Bridge Co.

180 tons, Bell Telephone building, Allentown, Pa., to Lehigh Structural Steel Co.

160 tons, substation, Commonwealth Edison Co., Chicago, to Hansell-Elcock Co.

140 tons, Twenty-seventh street viaduct, Kenmore, O., to Burger Iron Co.

133 tons, branch club for Y. M. C. A., Detroit, to Russell Wheel & Foundry Co.

130 tons, additional tonnage for screening plant at by-product coke works of Woodward Iron

Co., Birmingham, Ala., to unstated makers.
126 tons, garage for Strathmoor Motor Sales, Detroit, to Russell Wheel & Foundry Co.
123 tons, surgical laboratory for M. E. hospital, Indianapolis, through Leslie Colvin, general contractor, to Insley Mfg. Co.
120 tons, skull cracker building for Central Alloy Steel Corp., Massillon, O., to Massillon Bridge & Structural Co.
117 tons, apartment in Indianapolis, through E. A. Carson, general contractor, to Insley Mfg. Co.
100 tons, addition for Heil Co., Milwaukee, to Milwaukee Bridge Co.
100 tons, mezzanine floor for Crowley Milner Co., Detroit, to Russell Wheel & Foundry Co.
100 tons, highway bridge at Menominee, Wis., to Wisconsin Bridge & Iron Co.
Unstated tonnage, East telephone exchange building, Portland, Oreg., to Poole & McGonigle.

CONTRACTS PENDING

12,000 tons, 20-story building for Western Union Telegraph Co., Broadway, New York; bids July 7; previously was noted contemplated.
4200 tons, bridge for Texas & Pacific railroad, Melville, La.
4000 tons, estimated, 32-story apartment for French Tudor City development; New York; specifications expected out in next few weeks.
3500 tons, Samuel Tilden high school, Brooklyn, N.Y.
2000 tons, Womens hospital, 471 Central Park west, New York.
1500 tons, apartment, Ninety-fourth street and Central park, west, New York.
1500 tons, two bridges for Boston & Maine railroad, at Haverhill, Mass.
1000 tons, East End avenue memorial hall, Hartford, Conn.
1000 tons, bridge for Boston & Maine railroad, Saco, Me.
650 tons, highway bridge near Oklahoma City, Okla.
600 tons, Pennsylvania railroad electrification work, West Fifty-second street, Philadelphia; Shoemaker Bridge Co. low bidder.
600 tons, building for Robert O. Law Co., Chicago.
500 tons, addition to Union Pacific office building, Omaha, Neb.; steel bids soon.
500 tons, bridgework for Missouri Pacific railroad.
500 tons, bridge for Boston & Maine railroad, Salmon Falls, N. H.
500 tons, addition to plant of American Banknote Co., Hunts Point, Brooklyn, N. Y.
500 tons, state bridges, Vermont.
500 tons, Hartwick college, Oneonta, N. Y.
450 tons, Randolph exchange, Ohio Bell Telephone Co., Cleveland.
250 tons, S. S. Kresge Co. building, Sixty-third and Halsted streets, Chicago.

Iron Ore

Lake Shipments in June Show Large Increase Over May

Cleveland, July 3.—Shipments of Lake Superior iron ore by vessel in June totaled 8,926,216 tons, an increase of 3,563,401 tons over May. The June shipments also represent an increase of 467,350 tons over June, 1927. The total this year to July 1 is 14,294,977 tons, against 17,771,482 tons in the comparable period of 1927.

Consumption of iron ore increased 166,553 tons in June over May, according to the following report from the Lake Superior Iron Ore association:

	Tons
Ore consumed in April	4,781,205
Ore consumed in May	4,947,768
Increase in May	166,533
Ore consumed in May, 1927	5,012,782
Ore at furnaces June 1, 1928	13,942,157
Ore on Lake Erie docks June 1, 1928	4,934,564
Total at furnaces and Lake Erie docks June 1, 1928	18,876,721
Total, June 1, 1927	22,970,576

Concrete Bars

Chicago District Continues Active but Inquiries and Awards Are Diminishing

CONCRETE bar activity continues good for the season, with Chicago awards heavy. Inquiries are becoming less numerous and large tonnages pending in the market for a long time either are materializing or being postponed. Third quarter prices are steady. Occasional weakness develops on large tonnage inquiries with shading of quotations far under published levels.

REINFORCING BAR PRICES, PAGE 31

Chicago, July 3.—Reinforcing bar fabricators have had a steady procession of large sized projects before them for some time. During the past three weeks seven projects of more than 450 tons each have been closed. The largest project of this week is 600 tons for the Marshall Field welfare apartments, Chicago. The minimum price for rail steel bars is 2.00c for building, and billet bar sellers are maintaining a differential of $6 a ton. Rail steel bars for road and bridge work are quoted at 1.85c to 1.95c, Chicago Heights.

Composite report of reinforcing bars sold and shipped during the first five months of 1928 show an increase of 12 per cent over the same period of 1927, and 3 to 5 per cent over those months of 1926, according to the Concrete Reinforcing Steel institute. F. W. Dodge Corp. reports for the first five months of 1928 for all construction, excepting residence, show an increase of 2½ per cent over those months of 1927.

Boston, July 3.—More than 600 tons of reinforcing steel was contracted for during the past week and nearly 500 tons is pending. Prices hold steady.

Buffalo, July 2.—A large seller of reinforcing bars in this district reports June was one of the best sales months in history, although price pressure was constant and heavy. Larger inquiry this week totals 1000 tons and one 600-ton lot was sold. On large tonnage, prices as low as 1.95c, Buffalo, are reported quoted but most small business is being taken at 2.40c to 2.50c for local delivery. Reinforcing bar backlogs are good.

New York, July 3.—Prices on concrete reinforcing bars show a firmer tone in this district and sellers say they will be unable to name a lower price than 1.90c, base, Pittsburgh, on mill shipments during the third quarter. Some sellers already have recalled the 1.85c, base, Pittsburgh, price which had been their minimum of late.

Pittsburgh, July 3.—While a number of projects are being figured and refigured requiring fairly large quantities of reinforcing concrete bars, the tendency seems to be to delay closing. Awards this past week have again been limited to light tonnages. New billet concrete bars are quoted at 1.85c to 1.90c.

Cleveland, July 3.—Several jobs involving a fair tonnage of concrete reinforcing bars are being figured, but awards of the week were confined to carloads or smaller. New billet steel bars are being quoted 1.85c to 1.90c, Cleveland or Pittsburgh, for third quarter, with the higher price applying particularly to spot lots. Rail steel is reported weak, although 1.75c, mill, is quoted on the small tonnages moving.

Awards Compared

	Tons
Awards this week	4,215
Awards last week	12,428
Awards two weeks ago	6,607
Awards this week in 1927	6,539
Average weekly awards, June	7,534
Average weekly awards, 1928	7,492
Total awards to date, 1927	146,962
Total awards to date, 1928	194,793

CONTRACTS PLACED

700 tons, Broadway ramp, Seattle, reported awarded to Mercer Steel Co.; general contract to Lindstrom & Feigenson.
600 tons, Marshall Field welfare apartments, Chicago, to Truscon Steel Co.
600 tons, roadbed construction, new terminal, New York Central railroad, Buffalo, to Kalman Steel Co.
450 tons, rail steel, Hyde Park State bank, Chicago, to Calumet Steel Co., previously reported awarded unstated fabricator.
400 tons, north station, Boston & Maine railroad, Boston, to Barker Steel Co.
300 tons, roads in Connecticut, to Concrete Steel Co.
300 tons, West Seattle school, Seattle, to Pacific Coast Steel Co.
260 tons, Langdoll hall, Boston, to Concrete Steel Co., through George A. Fuller Co.
200 tons, apartment, 5110 Kenwood avenue, Chicago, to Concrete Engineering Co.
155 tons, Sears, Roebuck & Co. building at Tacoma, Wash., to Pacific Coast Steel Co.
125 tons, Chicago Arms apartment, Chicago, to Concrete Steel Co.
125 tons, bridge at Dedham, Mass., to Barker Steel Co.
125 tons, building for Sylvania Golf club, Sylvania, O., and Union National bank building, Fostoria, O., to Building Products Co., Toledo.
125 tons, Kobacker store building, Portsmouth, O., to Building Products Co., Toledo.
100 tons, new coal pocket at Fall River, Mass., to Barker Steel Co.
100 tons, club building, Chicago, to Joseph T. Ryerson & Son Inc.
100 tons, road steel for Allegheny county route No. 108, 45 tons, and Allegheny Paving Co., also for Allegheny county job, 55 tons, to

Truscon Steel Co.
100 tons, mausoleum, San Jose, Calif., to Pacific Coast Steel Co.

CONTRACTS PENDING

550 tons, building for Miehle Printing Press & Mfg. Co., Chicago.
525 tons, Cazenovia creek bridge, Buffalo, Meyer & Meyer, Buffalo, general contractors.
412 tons, bridge and approaches over Ouachita river on Arkadelphia-Hot Springs road, state highway No. 7, Arkansas state highway commission; bids in July 18 by Dwight H. Blackwood, chairman of commission, Little Rock, Ark.
380 tons, hotel at Twelfth and Locust streets, St. Louis; McKelvy,Carter Construction Co. general contractor.
300 tons, addition to Packard Motor Co. building, Boston; Frank S. Parker, architect.
300 tons, Rand building, Buffalo, John W. Cowper Co., general contractor.
200 tons, Women's club building, Chicago.
180 tons, abutments, Kill van Kull bridge, Bayonne, N. J., to Port Richmond, Staten Island, N. Y.; bids open July 5.
150 tons, addition to Cambridge hospital, Cambridge, Mass.
150 tons, building for Palmolive-Peet Co., Chicago.
134 tons, Bender road highway bridge, Milwaukee; bids close July 12.
100 tons, Bird Island pier project, Buffalo; bids soon.

Bolts, Nuts, Rivets

Third Quarter Contracts Well Covered and Specifications Steady

NUT AND BOLT PRICES, PAGE 32

Chicago, July 3.—Third quarter contracting for bolts, nuts and rivets has been completed, and all principal users have covered for that period. Operations continue at 60 per cent. At several plants inventories are being taken and production was kept at a good pace until that started. The price of 70 off for carriage and machine bolts represents the minimum quotation to larger users. Smaller buyers are quoted 60 off.

Pittsburgh, July 3.—Nut and bolt buyers are well scattered but each appears to be taking a fair tonnage. Specifications are steady and all are against third quarter contracts. Tonnages are comparable with second quarter. Jobbers order only in harmony with their rate of turnover, which is not as extensive as usual at this season. Large consumers of rivets, mainly structural shops, are ordering in a fairly active way, these orders being against 2.90c contracts.

Cleveland, July 3.—Activity in bolts and nuts is in contrast to the quiet in the rivet market. Demand for the former is well maintained, June business showing an improvement over May and the corresponding 1927 period. Orders are coming from a diversified list of users, with jobbers and the automotive industry supplying much of the demand. Operations are on a 65 to 70 per cent basis. Rivet buying continues to drag, June sales falling below the May level. Operations are only slightly over 40 per cent of capacity.

The fuel consumption when melting cold charges in an open-hearth furnace is approximately 40 per cent of the weight of the stock.

Rails, Cars

Track Accessories Most Active at Chicago—Rails and Equipment Less in Demand

ACTIVITY in track fastenings in the Chicago district included awards of 4000 to 5000 tons. Rail orders have disappeared and operations of mills in the Chicago territory have slipped under 80 per cent. Locomotive and freight car inquiries and awards are few. Argentine State Railways have placed 1100 cars with American builders.

RAILROAD TRACK PRICES, PAGE 32

New York, July 3.—Featuring the eastern car market is the award of 100 steel furniture cars by Erie and announcement of plans by Norfolk & Western for the rebuilding of 500 steel gondolas in its own shops. These latter are in addition to 250 recently noted as being rebuilt by this railroad. The largest export award in considerable time involves 1100 freight cars for the Argentine State railways. Fresh inquiry is light. Locomotive demand continues quiet. Pennsylvania railroad soon will install in service the 628 steel passenger cars which it placed on order in January.

American mills have booked some rail tonnage for shipment to the municipality of Kyoto, Japan, and they also have taken some rails for the Tokio subway system. Tenders now are being received on some additional rail tonnage for Tokio.

Norfolk & Western railroad is inquiring for 40,000 tons of 130-pound rails. A preliminary estimate of freight car awards in June is 2063, approximately 200 under the total for May. About 1350 freight cars and 335 coaches are pending.

Pittsburgh, July 3.—While great things are expected of the railroads in the last half in connection with purchases of track material, so far large inquiries have not developed.

Construction work commenced June 28 on the 38-mile extension of the Pittsburgh & West Virginia railway which is to link Cochran's Mills, a few miles south of Pittsburgh, with Connellsville, Pa. Orders for track, etc. were distributed among local producers.

Backlogs of heavy rail orders are well dissipated but the mills understand that some heavy buying programs are in immediate prospect by some of the more important railroads.

Relaying rails have sold at $22 to $25. Single carloads brought between those two figures during the past week or two.

Light rail orders from coal mine owners are spasmodic, calling mostly for single carloads. These all carry the $36, Pittsburgh, price.

Chicago, July 3.—Continued activity is shown in the track fastenings market. Purchases during the week totaled 4000 to 5000 tons in addition to the Pennsylvania order. Additional purchases of track accessories are to be made soon in this territory. Mill departments engaged in track fastenings work have not reduced output in the past four weeks.

Only a few miscellaneous lots of standard steel rails were sold during the week, totaling less than 1000 tons. Buying of miscellaneous carloads of light rails is showing more activity, considerable of this business coming from coal mines. Rail mill operations are tapering slightly and now are under 80 per cent.

Railroad repair shops have been taking some finished steel material from mills in this territory as a result of the cars being built by roads in their own shops.

CAR ORDERS PLACED

Allegheny River Coal Mining Co., 50 mine cars, to Loraine Car Co.
Argentine State Railways, 1100 miscellaneous freight cars, divided equally between American Car & Foundry Co. and Middleton Car Co.
Canadian National railways, three mail-baggage cars, to unnamed builder.
Erie, 100 steel furniture cars, to Magor Car Corp.
Norfolk & Western, rebuilding 500 steel gondolas, to own shops; these are in addition to 250 recently noted as awarded to company shops for rebuilding.
North American Car Co., repairs to 100 refrigerator cars, to own shops. Inquiry out for 100 underframes in addition to 50 express refrigerator cars long pending.
Pacific Electric, ten all steel passenger interurban cars, to St. Louis Car Co.

LOCOMOTIVE ORDERS PLACED

Chicago & Illinois Midland, one locomotive, to Baldwin Locomotive Works.
International Railways of Central America, four locomotives, to Baldwin Locomotive Works.
Saginaw Logging Co., one locomotive, to Baldwin Locomotive Works.

CAR ORDERS PENDING

Chesapeake & Ohio, six gasoline-electric cars and six trailers.
Cities Service Co., New York, six tank cars.
Commonwealth Edison Co., one transformer car.
Fruit Growers Express, 150 underframes.
M. H. Treadwell & Co., one flat car.

Announcement is made that plans have been completed for a national celebration of American Ceramic Week in connection with the thirty-first annual convention of the American Ceramic society at the Stevens hotel, Chicago, Feb. 4-9, 1929. R. C. Purdy, 2525 North High street, Columbus, O., is secretary of the society.

Strip

Makers Resist Efforts to Obtain Lower Prices—Concessions in Some Instances

COLD strip makers are holding prices well against efforts of consumers to develop lower prices. In hot strips prices are not so strong and some mills have given concessions to stimulate buying for stock. Automobile activity is helping to keep up average of demand. June total tonnage is in excess of that in May. Production is at 80 to 85 per cent.

STRIP PRICES, PAGE 32

Pittsburgh, July 3.—Cold strip makers are opposing with some success efforts of customers to force the market downward, and continue to quote 3.00c to 3.15c (2.75c to 2.90c on 3 tons or more). One instance is known in New York state where a small maker quoted 2.65c on a tonnage to get his material into a plant which hitherto has been closed to him, and that figure was quoted to a Michigan user by another small producer but the consumer placed the business with its regular source of supply at the regular market price. Cold strip orders have been holding up fairly well and specifying has been so active by automotive and other consuming lines in both cold and hot strips that total business for June is 15 to 25 per cent greater than May.

Price competition is even more keen in hot strips, and some makers encountering blue annealed sheet competition have gone to 1.90c, and in meeting plate competition have gone to 1.85c. On an attractive inquiry originating in northern Ohio for 300 tons or more, comprising only two sizes, namely 8⅝ and 6½-inch material, local producers quoted 1.90c, Pittsburgh, and believe they stand a good chance of getting the business. Strip makers here are operating at 80 to 85 per cent.

Philadelphia, July 3.—Demand for strip steel continues fair, but in some cases mills have helped their rolling schedules by getting consumers to take in some additional material for stock. In such instances the consumer has been allowed prices that made it worth his while to lay in the material and carry it. On the usual run of business prices on hot strip from 6 to 12 inches wide range from 1.75c to 1.85c, base, Pittsburgh, while on widths under 6 inches the price is around 2.00c base Pittsburgh. There is considerable variation, however, and in some cases there is a spread of only $2 a ton between the widths under and those over 6 inches. On cold rolled strip steel the usual base prices on lots of 3 tons or more are 2.75c and 2.90c, base, Pittsburgh, but on attractive tonnage these prices are being cut.

Cleveland, July 3.—Hot rolled strip steel prices for third quarter delivery continue to range down from 1.90c, Pittsburgh, for 6 to 12-inch, to 1.75c, the prevailing second quarter level. Some mills are holding to 1.85c minimum, but insufficitn business is being placed to offer a test. Demand is better than expected, operating and shipping schedules for the current week being better than usual for the season. Cold finished strip in the Cleveland territory continues on a 2.75c, Cleveland minimum, several attractive lots having been placed at that figure. A Cleveland district mill, however, has shaded this level $2 to meet outside competition.

Sir Henry Bessemer is credited with 120 patents. For 40 years but a single year passed without him securing one or more patents.

Cold Finished Steel

Shipments More Even Than in Past Years—June Total Heavy

COLD FINISHED PRICES, PAGE 31

Pittsburgh, July 3.—Third quarter contracting in cold finished bars is heavy. Customers are taking about the same tonnage as in second quarter. Expiring portions of second quarter contracts were adjusted downward $2 to 2.10c, base, when that price was announced for third quarter. Specifications continue strong and June tonnage brought the aggregate for second quarter beyond first quarter in some cases. Automotive tonnage, unlike other years, has shown no signs of a summer lull. While specifications for this purpose have dropped off in some directions, they have increased in others, maintaining a fairly even balance. Cold bar finishers believe that demand will be more or less even through the year.

No change so far has been made in the turned and ground shafting price, this line-up being as follows:

2 15/16 to 7 inches, inclusive	2.45c
1 15/16 to 2⅞ inches, inclusive	2.60c
1 9/16 to 1¾ inch, inclusive	2.75c
1 3/16 to 1½ inch, inclusive	2.90c
1⅛ inch	3.40c

Wire

Specifications Coming in Well for Wire but Nails Continue in Small Demand

WHILE nail buying continues light, with jobbers well supplied from contracts at lower than present prices, other wire products are active and prices are steady. Actual test of prices on wire has not been made but going business has not developed weakness. Nailmakers have met competition from jobbers in some instances. Wire specifications are good.

WIRE PRICES, PAGE 32

Pittsburgh, July 3.—Wire fabricators are specifying well against third quarter contracts at 2.50c. Nail business still is slow. Although all makers quote $2.65 as a third quarter base and several claim to have taken some contracts at that figure, the price has not received a real market test. Jobbers everywhere are well stocked with nails at lower figures. Wire mills are operated at 30, 40 or at most 50 per cent. Mills quoting $2.65 in some directions have met severe competition on the part of jobbers seeking the same business.

Chicago, July 3.—Slightly more tonnage is being placed with western wire mills by users of manufacturers' wire and by jobbers. The prolonged rainy spell in North Central and Missouri river territory has brought some uncertainty to jobbers. Demand for manufacturers' wire continues steady. Slight improvement is noted in the buying of nails. Producers are naming $2.70, Chicago or Western mills, for wire nails and it is admitted that some concessions have been granted recently below this price. Bright plain wire is quoted at 2.55c. Several larger buyers have covered for third quarter.

New York, July 3.—Some wire nail contracts have been extended from second through third quarter. As a rule, however, the trade is not much interested in placing nail requirements as most buyers have heavy stocks. The market continues $2.55 to $2.65, base, Pittsburgh, and $2.55 is done on most of the attractive business. On plain wire for manufacturing purposes the market continues 2.50c, base, Pittsburgh.

Worcester, Mass., July 3.—Third quarter contracts for wire are being held at the same price as last week, 2.65c, Worcester, on plain wire with some shading reported. The seasonal lull is less than usual but demand is spotty. Specialty materials and manufacturers' wire holds up well. Export demand is good. Mills are not accumulating stocks.

Nonferrous Metals

Upturn in Tin Is Outstanding Feature of Market—Copper, Lead, Aluminum and Nickel Steady but New Buying Lags

Prices of the Week, Cents a Pound

	Copper—Electro delivered	Copper—Lake delivered	Copper—Casting refinery	Straits Tin New York Spot	Straits Tin New York Futures	Lead New York	Lead East St. Louis	Zinc St. Louis	98-99% Aluminum	Spot Antimony	Ingot Nickel
June 27	14.75	14.82½	14.50	47.00	46.75	6.30	6.15	6.20	23.90	9.50	35.00
June 28	14.75	14.82½	14.50	47.12½	46.75	6.30	6.15	6.20	23.90	9.40	35.00
June 29	14.75	14.82½	14.50	47.25	46.87½	6.30	6.15	6.20	23.90	9.40	35.00
July 2	14.75	14.82½	14.50	46.12½	45.80	6.30	6.15	6.20	23.90	9.40	35.00

NEW YORK, July 2.—Tin turned much stronger after the low point of a week ago and during the past week tended upward. This was the only decidedly strong and active metal in the nonferrous list last week though a little strength was shown in prime western zinc. Copper, lead, aluminum and nickel remained unchanged and firm, with not much new business. Shipments of all metals continue large.

Some let-down is expected in the nonferrous metal trade, but no more than seasonal. In fact there are some indications that business will hold very well through the summer. Brass and copper mill products have held unchanged in prices since about the end of May.

Copper—The price of 14.75c, Connecticut, has ruled for more than a month, and though buying pressure has disappeared meanwhile, shipping pressure continues and the price is firm. Producers are practically sold out for July, and not a great deal of August shipment metal remains in the market. On the other hand, users here and abroad appear well covered for both months. A little buying has continued to be done from day to day and though quietness is expected for a while, it is probable some demand will continue right along. Export business has been light the past week and the price has held unchanged at 15.00c, c.i.f. European ports.

Tin—Users and dealers bought well of early and distant positions in tin. The feeling seemed to spread that the market had made a substantial change and yet there was much uncertainty on how the recovery would hold for the longer run. Deliveries of tin in this country last month were large at 6950 long tons, making 38,460 tons for the first half of the year. This sum was 1130 tons larger than in the first half a year ago and larger than other years except 1926 and 1925. Stocks at the end of the month were 2148 tons, a cut of 1260 in the month. The big decrease in stocks and the fact that they are well held, were responsible for a return of the premium on spot. World visible supplies at the end of June totaled 16,231 tons a cut of 833 tons during the month.

Zinc—Prime western was a little more active during the past week but the buying was not large. The price had been pegged at 6.15c, East St. Louis, for June shipment nearly all month, with a premium of 5 points recently established for July. A few days ago the price of 6.20c was asked and obtained for prompt and July and that became the minimum, with August-September going to 6.25c. These are the highest prices quoted in many months. High grade metal is unchanged and a big tonnage of this grade is moving.

Lead—A moderate amount of buying was done nearly every day for early shipment and though there was slight easiness one day on East St. Louis basis, the market remained essentially unchanged and in the past day or two has appeared firmer.

Nickel—Business in nickel so far this year has been unusually large, both for use in steel and in miscellaneous ways. Prices are unchanged.

Aluminum—Business is moderate and prices steady.—*Daily Metal Trade.*

Mill Products

Base prices cents per pound f.o.b. mill

SHEETS	
Yellow brass (high)	19.25
Copper, hot rolled	23.50
Lead, full sheets (cut ¼c more)	10.00
Zinc (100-pound base)	9.25
Aluminum, flat sheets, up to 10 gage, 3" to 72" wide	31.30
SEAMLESS TUBES	
Yellow brass (high)	24.12½
Copper	25.00
RODS	
Yellow brass (high, full turning)	17.00
Naval brass	19.75
WIRE	
Copper, car lots	16.37½
Yellow brass (high)	19.75

Old Metals

Dealers' buying prices, cents per pound

HEAVY RED BRASS	
New York	9.50 to 9.75
Chicago	9.50 to 10.00
Cleveland	10.00 to 10.25
HEAVY YELLOW BRASS	
Chicago	7.00 to 7.25
Cleveland	7.50 to 7.75
ZINC	
New York	3.50
Cleveland	3.25 to 3.50
HEAVY COPPER AND WIRE	
New York	12.25
Boston	11.75 to 12.25
Chicago	11.50 to 11.75
Cleveland	12.00 to 12.25
RED BRASS BORINGS	
New York	8.50 to 9.00
YELLOW BRASS TUBING	
Cleveland	7.50 to 7.75
LIGHT COPPER	
New York	10.75
Chicago	9.50 to 9.75
Cleveland	10.75 to 11.00
LIGHT BRASS	
Boston	5.75 to 6.00
Chicago	6.75 to 7.00
Cleveland	5.75 to 6.00
ALUMINUM	
Clippings, Cleveland	17.00 to 17.25
Borings, Cleveland	8.00 to 8.25
Cast, Cleveland	12.00 to 12.25
Cast, Boston	10.50 to 11.00

Secondary Metals

Remelt Aluminum No. 12	16.50 to 17.00
Brass ingot, 85-5-5-5	12.62½ to 12.87½

Coke By-Products

Sulphate Price Is Reaffirmed—Naphthalene Market Strong

New York, July 3.—Last year's contract price of $2.20, delivered, on sulphate of ammonia has again been named by leading sellers, with negotiations—about a month earlier than last year—being conducted with fertilizer manufacturers. Export shipments are being quoted at $2.30 to $2.35, port, for material in double bags, but little business is noted.

Due to unseasonable weather, the cleaning period this year has been delayed, with a result that activity in naphthalene continues pronounced, whereas normally it would be about over. This has resulted in an unusually strong market in flakes, with this description now holding on a parity with the market for balls which is 6.00c to 7.00c, works. Usually there is a 1 cent differential on flakes under the ball market.

Light oil distillates are unchanged, but with considerable activity in toluol and benzol. Solvent naphtha and commercial xylol demand are featureless.

Coke Oven By-Products

Per Gallon at Producers' Plants in Tank Lots

	Spot	Contracts
Pure benzol	$0.22	.....
90 per cent benzol	0.22	.....
Toluol	0.35	.....
Solvent naphtha	0.30	.....
Commercial xylol	0.30	.....
Phenol	0.17	.....
Per Pound at Producers' Plants		
Naphthalene flakes	0.06 to 0.07	
Naphthalene balls	0.06 to 0.07	
Per 100 Pounds Delivered		
Sulphate of ammonia	$2.20	

Warehouse

June Sales Totals Exceed May but First Half Generally Below Similar Period of 1928—Improvement in St. Louis District Continues

SALES from iron and steel warehouses in June generally exceeded those of June, 1927, but the first half of the current year fell behind that of 1927. Improvement continues in the St. Louis and southwestern districts. Prices are steady for the week excepting a $3 reduction on sheets at Chicago.

Boston warehouse business continues in fair volume. Many jobbers are encouraged by the outlook and believe there will be a gradual improvement. Despite the fact that steel mills have reduced cold finished stock, local warehouses have made no change in prices.

Although June sales of iron and steel by Buffalo warehouses were as large as those of June, 1927, the first half of 1928 runs considerably behind the corresponding period of 1927 in volume of business. The last half of 1927 showed a sharp decline in warehouse business and sellers are hopeful that a better final six months this year will put the total sales up to those of 1927.

Considering the season, warehouse demand in the New York metropolitan district has held up rather well. One large jobber reports that the business for the month exceeded that of May.

Philadelphia jobbers enjoyed fully as good business in June as in May and demand continues well maintained. Prices continue firm and quantity differentials generally are in force.

Cleveland jobbers report sales volumes for June at the May rate. July demand is expected to maintain the level of the past two months. Prices are firm on all products except nails and wire and sheets. Small lots of sheets from stock are being sold at the full quoted levels but large quantities subjected to shading.

Steel warehouses in the Chicago district announce price reductions in all sheets out of stock of $3 a ton. The drop in the warehouse price follows the recent declines by mills. Buying continues fairly active, particularly in blue annealed. General warehouse activity in June showed little drop from the preceding month. Sheet jobbers in the Chicago district also announce discontinuance of the $2 extra on blue annealed sheets of over 40 inches in width.

St. Louis warehousemen report business good, with numerous customers who had long deferred action now purchasing. Slightly better weather has proved beneficial. Some call has come from railroads and municipalities in the flooded areas for emergency repair materials.

Warehouse Quotations in Cents Per Pound at Leading Market Centers

STEEL BARS

Baltimore	3.10c
Boston	3.265c
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Cleveland	3.00c
Detroit	3.00c
Ft. Worth	3.75c
Houston	3.00c
Los Angeles	3.30c
New York††	3.25c
Philadelphia*	2.60c
Pittsburgh	2.90c
Portland	2.50c
San Francisco	3.15c
Seattle	3.00c
St. Louis	3.15c
St. Paul	3.25c
Tulsa	3.75c to 4.06c

IRON BARS

Baltimore	3.10c
Boston	3.265c
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Detroit	3.00c
Ft. Worth	3.75c
New York†	2.80c to 3.24c
Philadelphia*	2.60c
St. Louis	3.15c
Tulsa	3.75c to 4.06c

REINFORCING BARS

Baltimore	3.31c
Boston	3.265c to 3.50c
Buffalo	2.75c
Cincinnati	3.15c
Cleveland	2.20c
Detroit	3.00c
Ft. Worth	3.50c
Houston	3.00c
Los Angeles cl.	2.65c
Los Angeles lcl.	3.00c
New York	2.95c to 3.10c
Philadelphia	2.30c to 2.80c
Pittsburgh	2.75c to 3.175c
San Francisco cl.	2.85c
San Francisco lcl.	3.10c
Seattle	3.00c
St. Louis	3.15c
Tulsa	3.75c to 4.00c
Youngstown	2.30c to 2.60c

STRUCTURAL SHAPES

Baltimore	3.10c
Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland	3.00c
Detroit	3.10c
Ft. Worth	4.25c
Houston	3.25c
Los Angeles	3.30c
New York†	3.25c to 3.30c
Philadelphia	2.40c to 3.00c
Pittsburgh	3.00c
Portland	2.90c
San Francisco	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.75c to 4.16c

PLATES

Baltimore	3.10c
Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland, ¼-in. and thicker	3.00c
Cleve., 3/16-in.	3.20c
Detroit	3.10c
Detroit, 3/16-in.	3.30c
Ft. Worth	4.00c
Houston	3.00c
Los Angeles	3.30c
New York†	3.30c
New York† (floor)	5.05c to 5.10c
Philadelphia	2.40c to 3.00c
Phila., 3/16-in.	2.60c to 3.20c
Pittsburgh	3.00c
Portland	3.00c
San Francisco	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.75c to 4.16c

No. 10 BLUE ANNEALED

Baltimore	3.45c
Boston, 3/16-in.	3.915c
Buffalo	3.70c
Chicago	3.35c
Cincinnati	3.60c
Cleveland	3.25c
Detroit	3.50c
Ft. Worth	4.70c
Houston	3.90c
Los Angeles	4.00c
New York	3.90c
Portland	3.75c
Philadelphia*†	3.15c
Pittsburgh**	3.00c to 3.10c
San Francisco	3.75c
Seattle	4.00c
St. Louis	3.60c
St. Paul	3.75c
Tulsa	4.20c to 4.56c

No. 24 BLACK SHEETS

Baltimore	3.30c to 4.00c
Boston	5.00c
Buffalo	4.20c
Chicago	3.80c
Cincinnati	4.05c
Cleveland	3.65c
Detroit	4.10c
Ft. Worth	4.70c
Los Angeles	4.90c
New York	3.80c
Philadelphia*†	3.85c
Pittsburgh‡	3.55c
Portland	4.90c
San Francisco	4.95c
Seattle	5.00c
St. Louis	4.25c
St. Paul	3.95c
Tulsa	4.75c

No. 24 GALVANIZED SHEETS

Baltimore	4.15c to 4.75c
Boston	5.85c
Buffalo	4.70c to 5.05c
Chicago	4.65c
Cincinnati	4.90c
Cleveland	4.40c
Detroit	4.90c
Ft. Worth	5.50c
Houston	5.30c
Los Angeles	5.30c
New York	4.50c
Philadelphia *†	4.60c
Pittsburgh‡	4.40c
Portland	5.50c
San Francisco	5.50c
Seattle	5.75c
St. Louis	5.10c
St. Paul	4.90c
Tulsa	5.55c

BANDS

Baltimore	3.85c
Boston	4.015c to 5.00c
Buffalo	4.05c
Chicago	3.65c
Cincinnati	3.95c
Cleveland	3.65c
Detroit	3.65c
Ft. Worth	4.40c
Houston	3.65c
Los Angeles	4.15c
New York†	4.00c
Philadelphia*	3.25c
Pittsburgh	3.60c
Portland	3.75c
San Francisco	4.00c
Seattle	4.00c
St. Paul	3.90c
Tulsa	4.71c

HOOPS

Baltimore	4.00c
Boston	5.50c to 6.00c
Buffalo	4.05c
Chicago	4.15c
Cincinnati	4.40c
Cleveland	3.65c
Detroit	4.15c
New York†	4.50c
Philadelphia*	3.50c
Pittsburgh	4.50c
Seattle	5.00c
St. Paul	4.40c

COLD FINISHED STEEL

	Rounds, hexagons, squares	Flats, squares
Baltimore	3.35c	3.85c
Boston	3.45c	3.95c
Buffalo	3.95c	4.45c
Chicago	3.60c	4.10c
Cincinnati	3.85c	4.35c
Cleveland	3.65c	4.15c
Detroit	3.85c	4.35c
Los Angeles (a)	4.50c	.....
New York	3.40c	3.90c
Philadelphia*	3.35c	3.85c
Pittsburgh	3.60c	4.10c
Portland (a)	4.75c	.....
San Fran. (a)	4.25c	.....
Seattle (a)	5.00c	.....
St. Paul (a)	3.85c	.....
Tulsa	4.66c	5.16c

(a) Rounds only.

COLD ROLLED STRIP

Boston, 0.100-inch, 500 pound lots	5.30c
Buffalo	5.85c
Chicago (b)	6.10c
Cincinnati	7.15c
Cleveland (b)	5.95c
Detroit	5.80c
New York	5.15c
Philadelphia (c)	5.00c

(b) Net base, straightening, cutting, boxing 1 ton or more.
(c) Plus mill, size and quantity extras.

SWEDISH IRON AND STEEL

New York duty paid

Hollow drill steel	14.00c
Iron bars, rounds	6.25c
Flats and Squares	
Baltimore, New York, Phila.	6.60c

*Plus quantity differentials. †Minus quantity differentials. ††Domestic bars. ‡10 to 24 bundles. **25 or more sheets. *†50 or more bundles.

Pacific Coast

Summer Lull in Steel Buying —Concrete Bar Sales Heavy in First Half Year

THOUGH demand is relatively dull at present, first half business on the Pacific coast was excellent. Concrete bars during that period far exceeded similar period sof two preceding years. Plate and shape tonnage was not so heavy. Award by a cement maker for a building and deepwater pier provided the largest tonnage of the week. Prices are little changed.

San Francisco, June 30.—(By Air Mail)—Movement of iron and steel products on the Pacific Coast during the past week was by no means heavy, most awards involving lots of less than 100 tons. Prices remain unchanged, shapes and cast iron pipe being firm and plates and reinforcing steel bars weak.

Pig Iron and Coke

Foundry operations continue limited and most sales and inquiries call for small lots for prompt shipment.

Coast Pig Iron Prices

Utah basic	$25.00 to 26.00
Utah foundry	25.00 to 26.00
*German	24.25
*Indian	24.00 to 25.00
*Dutch	24.50

*C.i.f. duty paid.

No large bookings were reported this week. Prices on foundry iron are unchanged.

Bars, Plates and Shapes

Awards of concrete bars aggregated 417 tons, bringing the total for the first half of 1928 to 49,176 tons, compared with 26,058 tons for the first half of 1927, and 18,639 tons for the same period in 1926. The largest lettings involved 155 tons for a building in Tacoma and 100 tons for a mausoleum at San Jose, Calif., both booked by the Pacific Coast Steel Co. Out-of-stock quotations in the San Francisco district are becoming firmer and 1.80c does not appear as frequently as in the past.

Demand for plates during first half was light and aggregated 16,386 tons, compared with 45,392 tons and 36,940 tons respectively for the first half of 1927 and 1926. No awards of over 100 tons were noted this week. Bids were opened this week on 100 tons for a riveted pipe line at Sacramento, Calif. The larger producers of plates continue to quote 2.25c to 2.30c c.i.f.

Few structural steel shape awards were placed during the week. The Judson-Pacific Co. took 270 tons for an addition to the Robert Dollar building in San Francisco. Awards this week totaled 740 tons and brought the aggregate for the first six months of the year to 78,337 tons, compared with 82,060 and 70,271 tons respectively for the first half of 1927 and 1926. Taking into consideration the fact that early last year two Los Angeles projects alone required 14,000 tons, the aggregate this year is in excess of previous years. No new inquiries of size came up during the week. Plain material continues firm at 2.35c c.i.f.

Other Finished Material

The market for cast iron pipe remains quiet and few awards or inquiries have developed of late. Awards this week aggregated 436 tons and included 115 tons for Seattle and 321 tons for Holtville, Calif. Bookings for first half totaled 44,001 tons, compared with 49,191 tons for the first half of 1927 and 35,600 tons for the first half of 1926.

Seattle Trade Fair

Seattle, June 27.—While some lines of steel report business slacking off, others continue active. Several large contracts are pending, contractors appearing unwilling to purchase their requirements in advance of actual use. Local steel mills are prepared to give quick deliveries.

Seattle building permits for June will show a large total including a $3,000,000 permit for the Bon Marche department store, steel for which was ordered last month. Work on the $1,000,000 Benjamin Franklin hotel was started here this week. Pacific Coast Cement Co. has awarded the McEachern Construction Co. the contract for a $25,000 deep water pier and a clinker storage warehouse, one of the units of its new plant here. Construction is active in the Wenatchee, Wash. district where several cold storage plants are being erected at a cost of $1,000,000.

Pig Iron and Coke

Foundry operators report improved business, mill requirements and general jobbing contracts having given increased activity. Several local foundries are busy furnishing equipment for the new Weyerhaeuser saw mill being erected at Longview. There is little interest in pig iron and coke, prices of which are unchanged. A shipment of 1000 tons of Continental coke will arrive here this week from Antwerp, consigned to a local distributing firm.

Bars, Plates and Shapes

Mill prices of bars and shapes are unchanged at 2.35c, mill, representatives reporting inquiry rather slack. Plates are weaker, 2.25c being generally quoted and it is reported that business has been placed at 2.20c.

Local steel mills are quoting 2.20c firm on reinforcing materials. Business consists mostly of car lots and while present inquiry is less active orders of the last month have furnished a large total and operations have been steady. This week's awards include 300 tons for the West Seattle school to the Pacific Coast Steel Co. It is reported that 700 tons involved in the Broadway ramp at Portland will be furnished by the Mercer Steel Co.

The largest plate award in several weeks, 200 tons for burners at the new Weyerhaeuser lumber plant, Longview, was taken by Barde Steel Co.

Structural awards this week included 275 tons for the Pacific Coast Cement Co.'s clinker storage building to the Wallace Bridge & Structural Steel Co. and an unstated tonnage for a telephone building, Belmont avenue and East Seventeenth street, Portland, to Poole & McGonigle.

Finished Materials

Jobbing houses find June's totals will probably not be as large as last month. Prices are unchanged. Everything out of stock is moving in fair volume.

Seattle municipal street railway has awarded a contract to the Bethlehem Steel Co. for furnishing a special steel track layout, involving about 100 tons, on a bid of $33,780.

Several water main jobs in Seattle are pending and a number of contracts for cast iron pipe will be awarded soon. U. S. Cast Iron Pipe & Foundry Co. has closed for furnishing 660 tons to Seattle.

Prices on iron and steel scrap are unchanged. Local steel mills are paying $10 to $11 gross for steel scrap while cast iron scrap is nominally $14.50 to $15 gross but sales are limited.

Production Index Down

Washington, July 3.—Iron and steel production index number for May was 117, compared with 123 for April and 116 for last May, taking 1923-1925 as 100, according to the department of commerce. Nonferrous metals May production was 111, compared with 110 for April and 111 for May, 1927.

Index number for May for unfilled orders for iron and steel was 72, compared with 82 for April and 64 for last May.

Colonial Stack In July 20

New York, July 3.—The Colonial Iron Co. expects to blow in its furnace at Riddlesburg, Pa., about July 20. The furnace has been relined and is ready for operation but will not be lighted until the company has installed a coke screening device now on the ground and until the overhauling of its mine equipment has been completed. The furnace will produce foundry iron.

Continental Steel Quotas Are Unchanged

Cable dispatches from Commercial Attache H. C. MacLean, Paris, to the department of commerce say preliminary announcements covering the results of the meeting of the Continental Steel Entente held in Dusseldorf, Germany, June 25, indicate that the entente will maintain its present production schedule of 7,321,750 metric tons of raw steel per quarter-year over the ensuing three months and that for the present there will be no change in over-production penalties.

It is also reported that the committee formally elected Mr. Aloyse Meyer, director general of the Acieries Reunies Burbach-Eich-Dudelange of Luxemburg, president of the entente, to fill the vacancy created by the recent death of M. Emile Mayrisch, first oresident.

Issue Medal Rules

Directors of the American Iron and Steel institute have promulgated rules governing the award of the Gary Memorial and the American Iron and Steel institute medals. The Gary gold medal, in honor of the institute's first president, will be awarded not oftener than annually by a committee of five "for outstanding achievement in the iron and steel industry without restriction on account of nationality or sex." The institute bronze medal will be an annual award for the best paper read before the institute, to be determined by directors on recommendation of the committee on arrangements.

J. H. McLean Resigns

Duluth, July 3.—J. H. McLean, general manager of the Oliver Iron Mining Co., has resigned. LeRoy Salsich, assistant to the president, has been elected vice president and general manager. Mr. Salsich, named assistant to the president late last winter, formerly was assistant district manager with headquarters at Hibbing, Minn. A. Y. Peterson, general superintendent for the Oliver company in the Colerain district, has been appointed assistant to the president.

Suspends Route Schedule

Washington, July 3.—The interstate commerce commission has suspended until Jan. 25 the operation of certain railroad schedules which propose to restrict the routing on iron and steel articles from Steelton, Minn., to Sterling, Ill., and other destinations on the Chicago & North Western and Chicago, St. Paul, Minneapolis & Omaha railroads so as not to apply in connection with the Waterloo, Cedar Falls & Northern railroad as an intermediate carrier.

Another Stack Is Blown Out at Chicago

Chicago, July 3.—Steelworks operations again have declined from a week ago. Illinois Steel Co. has blown out another furnace at Gary, leaving nine in blast there, seven active at South Chicago, and one at Joliet, or 17 of that interest's 27 steelworks blast furnaces in operation. The leading interest has taken off three furnaces in the past three weeks. Inland Steel Co. has all its four furnaces blowing at Indiana Harbor, and Wisconsin Steel Co. continues to operate its three furnaces. Youngstown Sheet & Tube Co. has one steelworks stack blowing at its Indiana Harbor works. Twenty-five of the 36 steelworks stacks in the district thus are active. Open-hearth output also has been reduced slightly in the district. The operating rate is about 78 per cent. Sheet mill operations dropped sharply during the week because of the holiday. One producer had his two groups of hot mills down for the week.

Forge Plant Is Sold

Recent purchase by George F. Pettinos, Philadelphia, from the Parkesburg Iron Works, Parkesburg, Pa., comprised a forge plant at Spring City, Pa., which has been idle for some time. The Parkesburg plant of the company was not involved in any way. Recent mention of the sale by IRON TRADE REVIEW did not make this clear.

Holiday Hits Buffalo

Buffalo, July 3.—Steelworks operation will be a little lower this week due to holiday suspension but will be restored to around 85 per cent of capacity within ten days if demand reaches expected volume after the Fourth. Open hearth production last quarter averaged 80 to 85 per cent.

Reline Gulf States Stack

Birmingham, Ala., July 3.—Gulf States Steel Co. has blown out its stack at Alabama City for relining. It is expected to be relighted in 90 days.

Approximately 10 per cent of the coke needed per ton of pig iron is required for fusing the ash in the coke itself.

Pig Iron Continues Easy

(*Concluded from Page* 33)

close to full time operations. The cut to $15.50 on Birmingham iron has had a weakening effect here, though the leading local producer has not changed its quotation of $19 to $19.50 f.o.b. Granite City. This interest, however, is understood to be meeting all competition. Competition of boat iron in certain sections has also been a disturbing element.

Birmingham, Ala., July 3.—Steady selling has been done by Alabama furnace interests since the reduction to $15.50, Birmingham, for No. 2 foundry. Stocks on furnace yards do not exceed 60 days' output.

Toronto, Ont., July 3.—Advance buying was featured in foundry and malleable pig iron. A minor rush of melters to cover third quarter needs developed and it is estimated about 60 per cent of those who place advance contracts have covered. Others have closed contracts for about six weeks ahead, but the remainder do not appear to be in any hurry. Hand-to-mouth buying still is preferred by a large number of the smaller melters and it is from these that spot demand account is maintained at high level. Most orders for future delivery ranged from 500 to 1000 tons, with two or three running as high as 2500 tons. Spot sales average from 50 to 200 tons. Canadian pig iron prices are firm.

Philadelphia, July 3.—Pig iron from other districts principally Buffalo, has been offered delivered in this territory at around 50 cents a ton less than the eastern Pennsylvania delivered price. Eastern Pennsylvania furnaces have met these concessions, and foundry iron delivered at Philadelphia now is $20.26 to $20.76 for the base grade. A feature of offers by Buffalo producers is that they are based on carload deliveries over the remainder of the year. It is understood low prices have been offered on outside iron to pipe makers in this district but without any business resulting so far. The American Engineering Co., Philadelphia, has not yet closed on its recent inquiry for 600 tons.

Foreign Fluorspar Sales Are Heavy

New York, July 3.—Business in foreign fluorspar has been heavy and practically all of the tonnage available for shipment to the United States over the next three months has been taken. The price is understood to be about $17 per gross ton, duty paid, tidewater, equivalent to about $15 per net ton, duty paid, tidewater, on the 85 and 5 per cent grade. Although it is believed that the present duty of $5 per gross ton will be eventually increased 50 per cent, importers are assuming all tariff risks on shipments to be made in the next four or five weeks; some contracts carrying the clause that buyers have the right to cancel unshipped portions should the tariff be increased. Importers say that domestic fluorspar has been offered from $14.50 to $15 per net ton at Kentucky and Illinois mines.

Iron Production Starts Downward

FOLLOWING five consecutive months on the up-grade, production of coke pig iron in June turned down. The loss in tonnage was relatively small, but with the blowing out or banking of some blast furnace capacity, the usual summer recession is well on its way.

Total production of pig iron in June was 3,088,882 gross tons, against the revised output of 3,292,790 tons in May, the loss being 203,908 tons. June, however, had only 30 days, as compared with a full month of 31 days in May. Average daily production was 102,963 gross tons, or 3256 tons per day less than the 106,219-ton per day rate of the preceding month. The decrease represented 3.6 per cent. In June, 1927, total production was 3,089,726 tons and the average daily rate was 102,991 tons. These figures are almost on a parity. It is to be recalled that the seasonal recession last year started in May instead of June.

At the close of June, 191 blast furnaces were active; the total for May was 199. During the month, 2 merchant furnaces were blown in and 2 blown out or banked; of the nonmerchant or steelworks class, 3 were blown in and 11 blown out. Of the 191 stacks active, 40 were merchant and 151 were nonmerchant. As shown in the accompanying table operations in June were at the rate of 76 per cent, as compared with 78.3 per cent in May and 78 per cent in April.

Stacks blown in during June were: In Ohio: Lorain No. 3, National Tube Co. In Pennsylvania: Sheridan No. 2, Lavino Furnace Co.; Palmerton No. 2, New Jersey Zinc Co. In Maryland: Maryland F, Bethlehem Steel Co. In Alabama: Fairfield No. 5, Tennessee Coal, Iron & Railroad Co.

Stacks blown out during the month were: In Pennsylvania: Bethlehem D, Bethlehem Steel Co.; one Eliza, Jones & Laughlin Steel Corp.; Edgar Thomson K, Duquesne No. 4, Carrie No. 6 and Clairton No. 1, Carnegie Steel Co. In Maryland: Maryland D, Bethlehem Steel Co. In Alabama: Alabama City, Gulf States Steel Co.; Pioneer No. 2, Republic Iron & Steel Co. In Illinois: South Works No. 4, Illinois Steel Co.; Granite City A, St. Louis Gas & Coke Corp. In Indiana: Gary Nos. 6 and 11, Illinois Steel Co.

Rate of Operation

(Relation of Production to Capacity)

	1928†	1927*
June	76.0	73.2
May	78.3	77.7
April	78.0	81.2
March	76.1	79.8
February	73.6	74.7
January	67.8	71.2

*Based on coke pig iron capacity of 51,379,400 gross tons as of Dec. 31, 1926. †Based on capacity of 49,605,720 tons as of Dec. 31, 1927. Capacities computed by American Iron and Steel institute.

MONTHLY PRODUCTION

	1928	1927	1926	1925
Jan.	2,855,515	3,101,346	3,319,789	3,372,207
Feb.	2,898,668	2,940,604	2,923,850	3,214,067
Mar.	3,199,175	3,482,107	3,458,171	3,571,422
April	3,181,975	3,424,377	3,438,805	3,211,235
May	3,292,790	3,391,067	3,477,820	2,933,907
June	3,088,882	3,089,726	3,232,478	2,679,045
Total 6 mos.	18,517,005	19,429,227	19,850,913	18,981,883
July		2,954,625	3,224,663	2,665,262
Aug.		2,950,674	3,200,723	2,707,171
Sept.		2,782,500	3,163,269	2,725,885
Oct.		2,812,015	3,334,206	3,017,889
Nov.		2,661,863	3,237,992	3,023,257
Dec.		2,698,208	3,089,175	3,249,057
Total		36,289,112	39,100,941	36,370,404

AVERAGE DAILY PRODUCTION

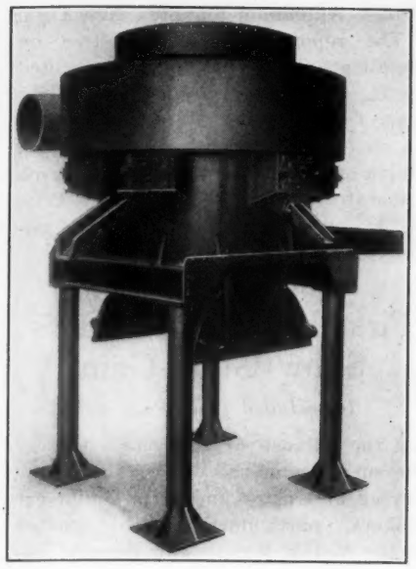
	1928	1927	1926	1925	1924
Jan.	92,113	100,043	107,039	108,781	97,273
Feb.	99,954	105,021	104,423	114,788	105,987
Mar.	103,199	112,326	111,554	115,207	111,787
Apr.	106,066	114,146	114,627	107,041	107,537
May	106,219	109,388	112,187	94,642	84,515
June	102,963	102,991	107,749	89,301	67,427
July		95,311	104,021	85,976	57,531
Aug.		95,183	103,249	87,328	60,741
Sept.		92,750	105,442	90,862	68,454
Oct.		90,710	107,555	97,351	79,419
Nov.		88,728	107,933	100,775	83,832
Dec.		87,039	99,651	104,808	95,367
Ave.	101,742	99,422	107,126	99,645	84,908

DIVISIONS OF PRODUCTION

1927	Merchant	Non-merchant	Spiegel and ferro-manganese
Jan.	745,766	2,355,580	40,330
Feb.	642,804	2,297,800	31,605
March	762,354	2,719,753	35,483
April	735,385	2,688,992	37,657
May	701,582	2,689,485	38,531
June	714,268	2,375,458	39,764
July	736,707	2,217,918	35,768
Aug.	667,104	2,283,570	30,383
Sept.	651,246	2,131,254	26,712
Oct.	688,880	2,123,135	24,763
Nov.	652,237	2,009,626	24,372
Dec.	660,616	2,037,592	27,809
Total	8,358,949	27,930,163	393,177
1928			
Jan.	649,654	2,205,861	32,510
Feb.	579,298	2,319,370	27,376
March	597,106	2,602,069	34,587
April	586,045	2,595,930	33,599
May	596,664	2,696,126	38,466
June	584,218	2,504,664	38,526

JUNE PIG IRON PRODUCTION

	No. in blast last day of month June	May	—Total tonnage made— Merchant	Nonmerchant	—Totals— June	May
Ohio	46	45	103,985	663,972	767,957	765,347
Pennsylvania	61	65	116,352	830,172	946,524	1,074,470
Alabama	17	18	97,481	100,622	198,103	204,010
New York	13	13	81,917	106,044	187,961	199,227
Illinois	15	17	86,336	209,786	296,122	346,397
Colorado	3	3				
Indiana	14	16				
Maryland	5	5	17,400	444,181	461,581	473,108
Virginia	2	2				
Wisconsin	0	0				
Kentucky	2	2				
Massachusetts	1	1				
Tennessee	2	2	34,349	76,533	110,882	107,114
Utah	1	1				
West Virginia	3	3				
Michigan	4	4				
Minnesota	2	2				
Missouri	0	0	35,700	43,878	79,578	83,212
New Jersey	0	0				
Texas	0	0				
Spiegel and ferro—all states	....	....	10,698	29,476	40,174	39,905
Total	191	199	584,218	2,504,664	3,088,882	3,292,790



No. 168—Structural type foundry cupola

Generator Set Furnishes Direct Current

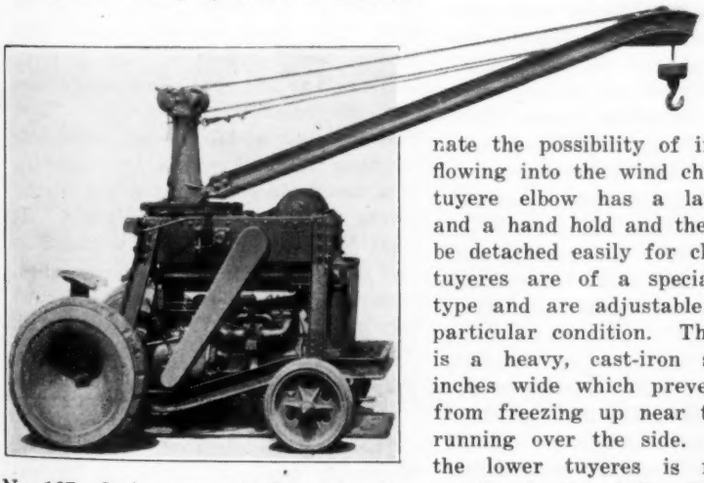
(*Concluded from Page* 20)

regulation. The engine is of the 4-stroke cycle type and fuel is injected without using an air compressor. It is provided with a self-starter and no heating devices are required. Lower grades of fuel oil are used. The unit is made also in 50, 80 and 100-kilowatt sizes as well as for alternating current supply.

Building Swing Crane on Gasoline Tractor

No. 167

Frederic H. Poor Inc., 50 Church street, New York, is placing on the market a small swing crane which is mounted on a Fordson-type gasoline tractor. This crane, which is shown in the accompanying illustration, moves from place to place under its own motive power and the power for lifting and swinging loads is derived through the power take-off from the tractor engine. In designing the crane, thorough consideration was given to providing stability and sturdiness in a movable unit. To this end specially weighted wheels are employed at both rear and front to counterbalance loads in suspension from the boom and broad tires sustain the loads without undue tire loading. The frame upon which the mast is located consists of a fabricated plate and channel structure secured at the rear to the axle housing and is suspended at the front in such a way as to compensate for irregularities in the floor or roadbed. The swinging boom is constructed of two steel channels and has a reach of 10 feet. The bull wheel by which the boom is swung about the mast is power driven by a chain and sprocket, giving a full swing arc of 240 degrees, or 120 degrees either side. By means of an expanding brake, the boom can be set in any fixed position. All controls are within easy reach of the operator.



No. 167—Swing crane built on tractor

Designs Foundry Cupola of Improved Style

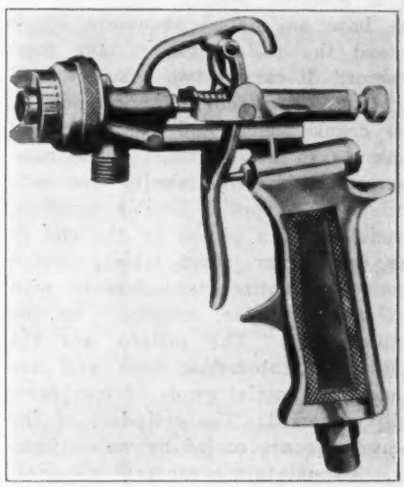
No. 168

Whiting Corp., Harvey, Ill., has introduced a new structural-type cupola, which has bottom doors fabricated from heavy boiler plate. This cupola, shown in the illustration, has straight cylindrical columns of wrought steel, which are filled with concrete when installed. A new safety spout has been built at the bottom of the tuyere elbow. A fusible lead plate of larger size than that used in previous models of the cupola is clamped tightly in a vertical position. The safety channel is merely a depression in one tuyere, two inches deep, leading to the safety spout. All joints of the windbox are welded. The windbox is placed above the tuyere boxes or elbows to eliminate the possibility of iron and slag flowing into the wind chamber Each tuyere elbow has a large peephole and a hand hold and the bottom may be detached easily for cleaning. The tuyeres are of a special continuous type and are adjustable to suit any particular condition. The slag spout is a heavy, cast-iron section, 11½ inches wide which prevents the slag from freezing up near the shell and running over the side. The size of the lower tuyeres is regulated by opening in the shell. This area may be reduced by moving in the supporting plates shutting off the shell opening any desired amount. The lower tuyeres are cast with a lip on the inside and are daubed with fire clay to eliminate freeing of iron to the tuyere plates. The company also has introduced a new bottom door hoist which may be operated by one man. This hoist is operated by a winch equipped with rachet and pawl, which brings both doors into position at the same time.

Paint Spray Gun Is Made Simple To Adjust

No. 169

Alexander Milburn Co., 1416 West Baltimore street, Baltimore, has designed a new paint spray gun which incorporates two new features. The first is a dialed head which gives numerous different spray adjustments from a circular spray to a fan of a wider field than has heretofore been possible. The dialing permits the operator to obtain the desired spray without making tests. The second feature is a series of indicator numerals on the paint valve plunger. A pointer is operated as the user turns the adjustment button. Just as the dial in the head produces the exact spray wanted, so the indicator numerals on the plunger provide the exact volume without testing. The operator, having found a certain class of work is best performed when the indicator points to a certain figure, makes the proper adjustment before beginning to spray. This improved gun is shown in the accompanying illustration. The new features have been designed in such a way that they may be used on a previous gun manufactured by the company. The new air control valve and the plunger have been made interchangeable.

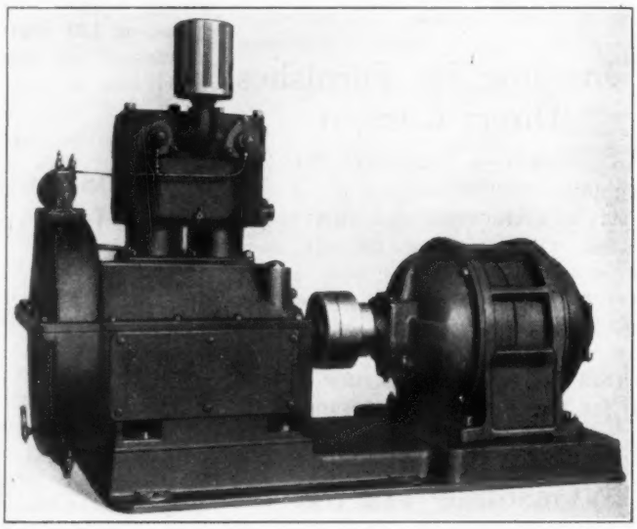


No. 169—Adjustable paint spray gun

Vertical Air Compressor Is Compactly Built

No. 170

Sullivan Machinery Co., 122 South Michigan avenue, Chicago, has introduced a vertical direct-motor-driven air compressor designed for industrial requirements in which a relatively small amount of compressed air is needed and in which compactness, continuous operation, portability and practically automatic control are important factors. This new unit is shown in the accompanying illustration. The two compressor cylinders are cast to one block and bolted to the crankcase. A one-piece cylinder head is bolted to the top of the block. A special type valve, standard on all compressors made by the company, is used for both inlet and discharge. An air filter is attached to the intake opening, which removes dust and solid matter from the air. The crankcase is a massive casting, supported on the base on planed shoulders which extend the full length of the compressor. It carries two bearings with strongly bolted caps for supporting the crank shaft, and has large oil channels to the bearings. The compressor and motor shafts are connected by a special flexible coupling, consisting of a pinion on the end of the compressor shaft which meshes around its entire circumference with an internal gear, attached to the motor shaft. The pistons are the hollow or automobile type and are made of a special grade of iron carefully annealed. The cylinders of the compressor are cooled by water jackets. To maintain a constant air pressure, these compressors are provided with an unloading device which regulates the pressure to within 5 pounds of the desired amount.



No. 170 — This electric motor driven double-cylinder air compressor is intended for use where relatively little air is needed and where compactness, continuous operation, portability and automatic control are important

Urges More Extended Use of Specifications

(*Concluded from Page* 22)

testing various grades of steel sheets under water at inland points and at two stations along the sea. The general committee on corrosion submitted two new tentative specifications, one for zinc-coated (galvanized) barb wire and the other for zinc-coated (galvanized) steel wire strand. These were accepted on vote of the members present.

C. S. Trewin, New Jersey Zinc Co., New York, vice chairman of the sectional committee on zinc coating of iron and steel in the report of the committee asked that new proposed specifications for zinc coatings on iron and steel pipe and fittings be printed for discussion and that two standards of the A. S. T. M., one on zinc coating on iron and steel sheets and the other for zinc (hot galvanized) coatings on structural steel shapes, plates, bars and their products be offered as tentative American Standards specifications. This action was taken.

J. R. Dawson, Union Carbide and Carbon Research Laboratories, Inc., Long Island, N. Y., read a paper by W. B. Miller of that organization recounting the procedure followed in making successful welds on high-chromium alloys. A neutral flame is recommended, with welding rods of the same composition as the metal in the case of sheet material. In welding castings, care is advised in preheating to red heat, to be followed by relatively slow cooling after the weld is completed. A flame with excess acetylene is recommended for castings that have a high-carbon content.

The closing session of the metals division was held Thursday night. The report of the committee on nonferrous metals and alloys was particularly comprehensive. This committee presented new tentative specifications for fire-refined copper, other than Lake, for seamless copper tubes, sand castings of the 80-10-10 composition and for silver solders.

A series of important appendices to the report of this committee make it one of the most outstanding contributions to the 1928 convention. These include the "Nature and Uses of Die-Castings," by Sam Tour, Doehler Die Casting Co., Batavia, N. Y.; a list of alloys agreed on for die castings investigation; standard testing procedure and test records; and "Notes on European Die-Casting Practice," by E. V. Pannell, of the British Aluminum Co. Ltd., New York.

The report of the committee on metallography, which was presented by H. C. Boynton, John A. Roebling Sons Co., Trenton, N. J., carried as an appendix a paper by H. S. George, Union Carbide & Carbon Research Laboratories Inc., Long Island City, N. Y., on conical illumination in microscopy.

First Half Tool Orders Show Good Gain

(*Concluded from Page* 19)

for the balance of the year. One of the surprises of the year is the steady buying of tractor and farm equipment makers, particularly those situated in the Middle West. This demand has not yet abated. That tractors and farm implements are selling well this year, seems somewhat surprising in view of the generally understood unfavorable position of the American farmer.

During the last six months, machinery and equipment sales have been extremely spasmodic and undependable. One week manufacturers and dealers would report a total lack of business and the next week would find just the opposite to be true. That business was about 50 per cent better than in 1927 places the industry in a favorable position, but not to the extent that might be imagined. It must be remembered that in the first half of 1927 sales were none too good. June of this year made a good showing, in fact, better than was expected, which gives rise to a belief that good business is ahead in the six months just opened.

The airplane plant of Vickers Ltd., Montreal, Que., is operating at capacity.

Motor Drive for Mills Is Gaining Favor

(*Continued from Page* 14)

take the bearings out of their housings and thoroughly clean them with a light oil about every six months to eliminate accumulation of dirt and grit, which gets into the bearings, as this would greatly prolong life and afford economy.

"There are today approximately 150 mills in this country which have antifriction bearings on the roll necks, and the greater percentage of these have been installed during the past two years. The writer knows of one group of mills which have been in continuous service for over 18 months, where the bearings have not been out of the mill. As to the question of life, we cannot say what this is, because where the conditions have been favorable to the application, and the bearings given the proper attention, we have yet to see a worn out bearing. From a commercial viewpoint, the rolling mill undoubtedly offers a better opportunity for the use of antifriction bearings than any other equipment in the steel mill. The use of antifriction bearings affords a power saving of about 40 to 50 per cent, a saving in lubrication, and better control of tolerances on finished products, consequently reducing rejections, all of which means a reduction in manufacturing costs."

Mr. Van Campen gave a list of more than 50 mills equipped with antifriction bearings for roll necks which are installed in the United States.

Traces Recent Development of Electric Heat

GEORGE H. SCHAEFFER, electrical engineer, Carpenter Steel Co., Reading, Pa., as chairman of the committee on electric heat, presented the most recent developments and applications in that field. Previous reports covered the subject from the initial electric heat experiments and traced the developments to the present time. The present report featured on the activities which have developed since the last convention. This year the committee has included the subject of welding, covering the developments as relating to steel mill work.

"Operating data on any individual electric furnace to be of value must give a complete analysis of all the conditions surrounding the operation," said Mr. Schaeffer. "The compilation of this data on a sufficient number of furnaces to give an accurate picture of present practices would make an extremely lengthy report. It may be better to consider the average operation on a number of plants using several types of electric melting furnaces.

Cites Foundry Data

"A summary on ten foundries making steel castings results in the following:

Smallest charge per month, tons	420
Largest charge per months, tons	845
Average charge per month, tons	510
Highest power consumption per ton, kilowatt-hours	687
Lowest power consumption per ton, Kilowatt-hours	548
Average power consumption per ton, kilowatt-hours	607
Average electrode consumption per ton:	
Amorphous carbon, pounds	16
Graphite, pounds	7½

"All the above figures are based on one month's actual operation and represent an average condition in the steel foundry industry that has obtained for the last three or four years, operation at 50 to 60 per cent.

"These figures are improved by increased production as indicated by the following data on a particular furnace: Furnace installed in Central New York; rated 5-foot diameter of shell, 350 kilovolt-amperes; normal holding capacity 2000 pounds; and melting rate 1000 pounds per hour. Under a period of rush production in the foundry, which makes acid steel castings, this furnace produced: At rate of 75 heats per five 24-hour days; average charge per heat 1800 pounds; actual production approximately 1250 pounds per hour; power consumption 525 kilowatt-hours per ton; electrode consumption approximately 5½ pounds graphite.

"Under present normal conditions when this furnace is operating six to nine heats per day the power consumption is approximately 550 kilowatt hours per ton and the electrode consumption 6½ pounds. The general trend of operating costs in electric melting furnaces is downward. This is due to more intelligent operation, the use of higher melting voltage and higher melting rates, the standardizing of melting practice," etc.

Test on 25-ton Heroult-type electric melting furnace

Kilowatts per ton charge	508
Kilowatts per ton ingots	559
Kilowatts per ton melted	541
Electrode (graphite) per ton ingot, pounds	12
Electrode (graphite) per ton melted, pounds	11½
Metal to O. K. ingot, per cent	91
Furnace metal loss, per cent	61.2

Efficiency based on 331.5 kilowatt-hours for 10 per cent superheat and 100 per cent efficiency

Average monthly power factor, per cent	84.5
Time—tap to top	5 to 7 hours

(Above figures from 30-day operation)

Interesting discussion followed the paper by J. C. Dobelbower, engineer Crocker Wheeler Electric Mfg. Co., Ampere, N. J., on "Present Practices in Connection with Motor-Driven Rollers." Discussion centered on the group type of motor drive on roll-out tables, and satisfactory results were cited. Some faults of the application were pointed out. It was stated that the group drive, whether of the cable and sheave type, or bevel gear type, lacks flexibility in that the individual rollers cannot be controlled in case of motor trouble, breakage of cable or gears. With the rollout motor drive the failure of a driving motor affects only the one roller and the failure of a number of motors in the train would not result in a shutdown of the table.

"Probably the main reason why individual driving of rollers did not come into general use sooner was due to the fact that antifriction bearings were the exception and not the rule on electric motors," said Mr. Dobelbower. "There have been some installations in service for a good many years with motors having sleeve bearings but I feel that this type of drive is one that should have a motor with antifriction bearings.

"Rollout motors of the general purpose design can, if desired, be ventilated. If this is done, however, it is necessary that clean air be supplied; the ventilation can be obtained by bringing the clean air in one end of the motor at the bottom and discharging it at bottom of the opposite end. This type of motor, however, should not require ventilation as it is comparable to any fully enclosed motor operating in a hot place. The rollout motor of the design where the motor is built directly in the roller is, however, a different problem; the motor in this case is subjected directly to the heat from the strip or rod being carried on the outer surface of the motor; thus heat is applied to the surface which, in the ordinary design of motors, is the surface from which heat is radiated.

Saving Is Effected

"While I have not investigated upkeep costs of group drive versus roll-out motor drive, yet I personally feel that there is considerable saving in the use of the latter. It is certainly true that the yearly replacement of cable as used in the group drive will pay for the repairing of a great many motors, and the cable is only one of the parts that may fail. I will be interested in hearing a statement from some one who has made an investigation of this phase of the application.

"There will no doubt be a number of the mill engineers who will stick to the group drive, for after all, the personal equation is a large factor in such problems as this. We, however, feel that the rollout motor has proven itself and from the numerous inquiries regarding same we believe that the future will see most of the mills in the country equipped with individual motor drives on their roll-out tables."

L. B. McMillan, Johns-Manville Corp., New York, gave a paper on "The Insulation of Open-Hearth Furnace Regenerators." "One of the outstanding improvements of recent years in the design and operation of open-hearth furnaces has been the application of insulation to the regenerator checker chamber," said

Mr. McMillan. "The magnitude of the radiation losses from open-hearth furnaces has long been recognized, but the fact that the furnace itself could not be insulated because of the excessive temperatures on available refractories has detracted attention from the substantial economies which could be effected by insulating the checker chambers. Yet the object of this paper is not merely to discuss theoretical savings which might be accomplished through minimizing radiation losses, but is to call attention also to the highly satisfactory and very practical results which are now being accomplished on actual installations. This is a case where actual operating results far exceed the savings shown by calculations based on radiation losses alone, because insulation properly applied minimizes air leakage losses also. Furthermore, the many successful installations have proven that with suitably designed insulation the earlier fears as to possible ill effects on refractories were unfounded.

"Among the advantageous results obtained through the use of insulation on checker chambers are: (1) A direct saving in fuel consumed per ton of steel produced; (2) increased temperature of the preheated air and gas; (3) improved conditions of furnace atmosphere, due to reduced air leakage; (4) increased speed of heats; (5) increased production; (6) decreased losses during Sunday shut downs; and (7) increased temperatures in gases delivered to waste heat boilers, resulting in increased steam production. All of these results have been secured in varying degrees in a great many actual installations.

Fuel Savings Advantageous

In some cases the saving in fuel has been the outstanding advantage. In others increased speed of heats and increased production have been most noticeable. In still others the most notable feature was increased steam production in the waste heat boilers. Naturally, with varying conditions of operation the various items will not show up in the same proportion in each installation, but in every installation investigated it was found to be unmistakably apparent that highly desirable results were being obtained, and this without detrimental effect on the brick work where insulation was properly proportioned to the conditions involved.

"The best means of estimating the savings in heat transmission losses is through the use of calculations based on the thickness and conductivities of the materials and the temperature conditions involved. Such computations show that in reduced transmission losses alone the insulation of cheeker chambers is fully justified, and the saving through reduction of infiltration losses is just so much more net gain."

It was brought out in the following discussion that melting time is quickened through proper insulation and that experiments have shown that radiation losses have been reduced 60 to 70 per cent. It was found also that steel jackets are effective in insulation work. It was pointed out that bottoms could be insulated when checkers are removed, without great cost. One experience cited was that melting time was reduced 50 minutes by insulation.

Many Exhibitors Show Equipment

NEARLY 100 exhibitors of steelworks electrical equipment, rolling mill and furnace installations and accessories, and alloy steel and castings had booths at the exposition in connection with the convention in the exhibition hall of the Stevens hotel.

The largest exhibits in point of space occupied were those of the General Electric Co., Schenectady, N. Y.; Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.; and Reliance Electric & Engineering Co., Cleveland. The General Electric Co. exhibit displayed the control panel brought out in 1925, the mill type magnetic-time controller, the cam-type master switch now going on the market, the cam-type quick-break limit switch, and other mill-type electrical equipment. The armor-clad switch gear also was shown.

The Westinghouse company exhibited the photoglow tubes used as flag switches with magnetic controller on an automatic reversing model roll table. This exhibit attracted considerable attention. The company's new inductive time-limit dynamic-breaking controller also was shown. Included in the exhibit was the reversing and plugging controller panel, which illustrated the path of the current by colored lights. Also, the exhibit showed the inductive-time limit relay with a long-time range of 2 to 15 seconds. The exhibit also included the grid-glow tube device.

The Reliance company exhibited many types of mill motors and accessories.

Pittsburgh Electric & Machinery Works, Pittsburgh, displayed exhaust ventilating fans on the principle of the airplane propeller manufactured by the Hartzell Propeller Co., Piqua, O., illustrating a production of 4000 cubic feet per minute of air by a 1/20-horsepower motor drive.

Allis-Chalmers Mfg. Co., Milwaukee, showed its totally-enclosed motors with external forced ventilation, and distributing transformers. Tool Steel Gear & Pinion Co., Cincinnati, exhibited its special hardened steel products for gears and pinions, also crane track wheels, herringbone gears, leveler rolls, coal crushers, and its new line of tool steel speed reducers with tool steel gears throughout. Fairbanks, Morse & Co., Chicago, exhibited an interesting line of ball bearing motors, both direct and alternating current, up to 1000 horsepower.

United States Graphite Co., Saginaw, Mich., showed graphite ore and metal products. Erie Malleable Iron Co., Erie, Pa., displayed a large assortment of various sized castings.

The Aluminum Co. of America, Pittsburgh, displayed the aluminum busbar installation for the continuous hot strip mill of the American Rolling Mill Co., Middletown, O. Morgan Engineering Co., Alliance, O., presented a model of a 54-inch two-high blooming mill, models of low-type floor charger, one-piece trolley frame, screw-type ingot stripper, ladle crane and other models. Chapman-Stein Co., Mount Vernon, O., showed models of recuperative soaking pit installations. R. D. Nuttall Co., Pittsburgh, had on display its new speed reducing equipment, heat-treated gears and shafts with anti-friction bearings. The latter exhibit also included ground tooth gears, some ground up to about 10 feet in diameter. The Metal & Thermit Corp., New York, showed cross sections of rolls, pinions, housings and shafting, all thermit welded.

Other exhibitors included Baker-Raulang Co., Cleveland; Alliance Machine Co., Alliance, O.; Cutler-Hammer Mfg. Co., Milwaukee; Colts Patent Fire Arms Mfg. Co., Hartford, Conn.; Edison Storage Battery Co., Orange, N. J.; Freyn Engineering Co., Chicago; Johns-Manville Corp., New York; Norma-Hoffman Bearings Corp., Long Island City, N. Y.; Reed Filter Co., Louisville, Ky.; National Air Filter Co., Chicago; Timken Roller Bearing Co., Canton, O.; with a complete line of mill bearings, and a number of others.

The National Air Filter Co. displayed some new equipment, including a dust arrester, a two-pass air filter, filters for small and medium-sized air compressors, and a dry process cabinet filter. The Hagan Corp., Pittsburgh, exhibited a glass-front steam purifier.

Here and There in Industry

Timely Information Which Records Developments in Various Lines of Productive Enterprise

KOHLER CO., Kohler, Wis., will spend about $250,000 in the enlargement of its pottery plant facilities by building a dry kiln addition, 125 x 500 feet. The concern manufactures bathroom fixtures and farm lighting and pumping plants. Contracts for the new kiln have been awarded to the Immel Construction Co., Dana building, Fond du Lac, Wis. The architect is Richard Philipp, 405 Broadway, Milwaukee.

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CHINOOK IRON CO., Seattle, has changed its name to International Steel Corp. J. E. Howley, 1201 Vale street, is a director.

* * *

NORTHWEST FENCE & WIRE WORKS, Seattle, has moved to a larger plant at 1936 First avenue south.

* * *

GENERAL CABLE CORP., New York, has bought 60 acres on deep water at Mobile, Ala., and will build a copper wire mill to supply southern and southwestern territory.

* * *

PACIFIC COAST STEEL CO., Seattle, has installed two Shaw overhead electric cranes of 100-foot span and 7½ tons lift. They are used in the scrap yard.

* * *

AMERICAN RADIATOR CO. has established a branch office at Birmingham, Ala., in charge of James Kinney, formerly at Cincinnati. Birmingham heretofore has been under the Atlanta office.

* * *

BEEHLER STEEL PRODUCTS CO., St. Louis, William Steinbreder, president, has bought the plant formerly occupied by the Evertite Piston Ring Co. It includes buildings on an eight-acre tract.

* * *

NAYLOR SPIRAL PIPE CO., Chicago, has changed its name to Naylor Pipe Co. The company recently has completed a new plant which has doubled its capacity. No change in management or officers will be made.

* * *

ALUMINUM CO. OF AMERICA has begun the manufacture of barium and zinc fluorides, for use in the enamel, glass, tile and brick trades. Charles Hardy Inc., 100 East Forty-second street, New York, has been appointed distributing agent for the United States.

* * *

BROWN INSTRUMENT CO., Philadelphia, manufacturer of industrial and power plant indicating and recording instruments, is building a 2-story addition to its plant, 44 x 60 feet, with provision for additional stories. This is the third addition in eight years and will be devoted largely to research work.

* * *

GENERAL PATTERN CO., Elyria, O., has added to its line and now produces wood and metal patterns in all types. It supplies patterns for the Pfandler Mfg. Co., Duplex Mfg. Co., H. Colson Co., Wellington Machine Co., Sterling Foundry Co., Central Tractor Co. and Lorain Brass & Bronze Co. J. A. Gahagan is president and general manager.

* * *

JENISON MACHINERY CO., 50 Fremont street, San Francisco, has bought the good will and machinery stock of the San Francisco division of the Smith Booth Usher Co. E. S. Jenison is president of the new company, T. F. Pimper vice president, H. L. Davis secretary, and H. J. Schiefer secretary.

* * *

SAFETY AUTO SIGNAL CO., 1517 South Michigan boulevard, Chicago, is being organized by Oscar A. Epp and others, to manufacture a patented automotive signal. J. H. Bolton is president, E. J. Govin, vice president; O. A. Epp, treasurer and general manager; J. J. Epp, sales manager, and S. C. Dooley, secretary. A plant is being sought for immediate occupancy.

* * *

PURCHASING AGENTS' ASSOCIATION OF NEW YORK has elected Robert W. Hafner, Standard Varnish Co., New York, president, succeeding E. H. Hawkins, of E. I. du Pont de Nemours & Co. Other officers elected were: Vice president, W. E. Johnson, Bell Telephone laboratories and Carleton Reynell, McClelland & Junkersfield; treasurer. E. B. Fields, New York & Queens Electric Light & Power Co. Newly elected to the executive committee are A. H. Hannoch, the Eleto Co., and Theodore M. Johnson, New York university.

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MANITOWOC ENGINEERING WORKS, a division of the Manitowoc (Wis.) Shipbuilding Corp., has acquired all rights to the manufacture and sale of the crane, formerly conducted by the Moore Speed Crane Co., 2916 West Twenty-sixth street, Chicago. The Moore company will continue as authorized sales representative in the Chicago territory. New York representatives are Forsythe Bros., 30 Church street.

* * *

CHAS. S. ANGERS MFG. CO., 2220 Lisbon avenue, Milwaukee, manufacturer of machinery, equipment and fixtures for boot and shoe factories, has purchased the plant of the Keystone Glue Co. at the south limits of South Milwaukee, Wis. The property consists of 46 acres and a number of buildings. The Angers plant will be moved to the new works at once and an increase of 100 per cent in output is planned. Alfred Angers is secretary and treasurer.

* * *

WESTINGHOUSE ELECTRIC & MFG. CO., East Pittsburgh, Pa., has changed its fiscal year to end Dec. 31, instead of March 31. The annual meeting of stockholders hereafter will be held the second Wednesday in April. Charles A. Terry, a vice president, has been elected a director to succeed the late Guy E. Tripp. Joseph W. Marsh, of the General Cable Co., H. H. Westinghouse, of the Westinghouse Airbrake Co., and Albert H. Wiggins, a vice president, were re-elected directors.

* * *

NEW ENGLAND Iron and Hardware association has elected Franklin E. Braff, Bangor, Me., as president. William H. Bowe, Boston, has been made vice president. Directors include: Charles A. Adams of Manchester, N. H.; C. D. Alexander of Portland, Me.; R. M. Boutwell, William H. Howe, F. Marsena Butts, Quincy W. Wales, Mr. Bragg, Frank E. Chase of Boston; G. M. Congdon of Providence, R. I.; M. B. Damon of Fitchburg, Mass.; Clarence C. Dodge of Worcester, Mass.; George M. Gray of Cambridge, Mass.; W. A.

Hopkins, Charles W. Henderson Jr., and Robert H. Sanderson of Cambridge, Mass.

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AKRON WELDING CO., Akron, O., has bought a site on which an addition will be built. It is planned to add an auto spring division to the present welding business.

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CRIBBEN & SEXTON STOVE CO., Chicago, has placed an order with the Ferro Enamel Supply Co., Cleveland, for an enameling furnace, the second within two months.

* * *

DeMEY CONSTRUCTION CO., contracting engineer, 801 Maloney building, Pittsburgh, has been formed by Edouard DeMey, formerly of Conley & DeMey, Pittsburgh.

* * *

CRUCIBLE STEEL CASTING CO., Cleveland, has changed its equipment from belt to electric drive, added a large capacity air compressor and installed complete new grinding equipment.

* * *

ERIE IRON WORKS LTD., St. Thomas, Ont., has been recognized with W. T. Greatrex, Toronto, Ont., as president and general manager, succeeding W. G. Rogers. The plant will be renovated and enlarged.

* * *

HELLER BROS. CO., Newark, N. J., is building an addition to its plant at Newcomerstown, O., to be occupied about Sept. 1. The tool department is to be moved from Newark to Newcomerstown.

* * *

UNION METAL MFG. CO., Canton, O., has taken an order from Chicago for 4700 metal street lamp standards of one design. This will supply employment for the plant for about three months.

* * *

AXMANN SAND-THROWING MACHINE CO., 1833 Columbus road, Cleveland, has appointed W. Scott Thomas, 303 National Exchange Bank building, Providence, R. I., representative in New England for its machinery and equipment.

* * *

SIMPLEX MFG. CO., Spokane, D. H. Wells, president, is undertaking the manufacture of a new machine invented by A. R. Brewer of Spokane. The machine is designed to do lathe work, milling, drilling, boring, slotting, shaping, planing and grinding.

* * *

MASSILLON RIVET & MFG. CO., Massillon, O., succeeds the Canton Bolt Co. and the plant of the latter will be moved to Massillon, into larger quarters. Small rivets will be manufactured by the cold process and considerable new equipment has been installed.

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RAMSEY ACCESSORIES CO., Holland, Mich., manufacturer of pistons and rings, has bought the plant formerly owned by the Davis Boring Tool Co. at St. Louis and will move its plant there from Holland. John Ramsey, Holland, Mich., is president.

* * *

WAUKESHA MOTOR CO., Waukesha, Wis., is planning plant extensions to increase production 50 to 75 per cent in heavy duty gasoline power units. Additional buildings will be erected and equipped. H. L. Horning is president, and S. A. Perkins, secretary and treasurer.

* * *

MATHEWS STEEL CASTINGS CO., 3311 West Seventy-third street, Cleveland, is adding four large molding machines and sand handling equipment. The machines are furnished by the Herman Pneumatic Co., Zelienople, Pa., and the sand equipment by the C. O. Bartlett & Snow Co., Cleveland.

* * *

MAHONEY AIRCRAFT CORP., San Diego, Calif., will remove its plant to Lambert field at St. Louis, provision for its occupancy being about 75 per cent complete. The company is producing about 20 planes per month. This company built Col. Charles A. Lindbergh's transatlantic plane and the new plane he recently bought.

* * *

RANK & GOODELL, manufacturers' agents, dealing in railway supplies, St. Paul, which has been a partnership of Charles G. Rank and George H. Goodell, has been dissolved by retirement of the former. The business will be conducted as Goodell & Hoppe, 906 Merchants National Bank building. Carl M. Hoppe will be associated with Mr. Goodell.

* * *

TIMMS SPRING CO., Elyria, O., is building an addition to its plant to increase production. This is the second addition this year. The company manufactures wire springs and specialties, oil-tempered springs, flat and round wire, and light stampings of steel, brass and phosphor bronze. The oil tempering department is a recent addition.

* * *

HERTNER ELECTRIC CO., Cleveland, is building a new plant at 12800 Elmwood avenue. A new type motor is a recent addition to its line. The company also manufactures battery charging equipment, motor generators, and motion picture generator sets. J. H. Hertner is president, Mrs. Emma Hertner vice president, and C. C. Dash secretary.

* * *

MOLONEY ELECTRIC CO., St. Louis, manufacturer of electric transformers, which was bought in 1925 by the American Brown Boveri Co., has been bought from the latter by Stifef, Nicholas & Co., brokers, St. Louis. No change will be made in policy, management or personnel of the company. Thomas O. Moloney is president. With James J. Mullen he established the company in 1897.

* * *

GEORGE A. MORRISEY, St. Louis, has bought a 10-acre tract at Granite City, Ill., and will build a coal distillation plant of his own design, for the manufacture of coke and by-products. He formerly was associated with the American Coke & Chemical Co. and the St. Louis Gas & Coke Co. He has designed ovens for a number of plants. The new plant will coke coal from Illinois mines.

* * *

JAMES B. CLOW & SONS, Chicago, who recently bought a controlling interest in the National Cast Iron Pipe Co., Birmingham, Ala., state that each company will retain its present name and officers and organization of each will remain intact. Paul A. Ivy, of the Clow interest, will become a vice president of the National Cast Iron Pipe Co., and representation on the board of directors of the latter company will be given the Clow interest.

Lights Malleable Furnace

Due to increased business, the second furnace of the Western Malleables, Inc., Beaver Dam, Wis., was put into operation, June 25. The plant was reopened two months ago with one furnace and 150 men and 100 men have now been added. H. L. Kirch is general manager of the reorganized concern.

Designing Tube Plant

Cleveland, July 3.—The Sessions Engineering Co., Chicago and Detroit, is drawing plans for the new plant to be built by Steel & Tubes Inc., Cleveland, at Ferndale, Mich., a suburb of Detroit. Contracts are expected to be let within the next two weeks and the plant is to be making light gage electric welded steel tubing about the end of the year.

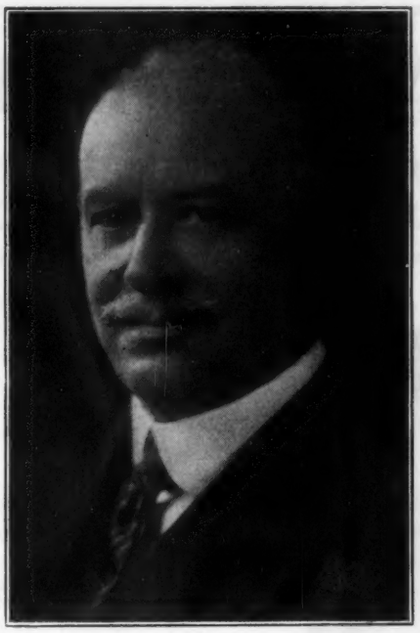
Schwab Approves Idea of Better Distribution

(*Continued from Page* 12)

better merchandising and distributing methods.

Various aspects of the general problem were discussed by numerous speakers representing manufacturers, warehouse interests, jobbers, mill supply houses and wholesale hardware dealers. Among those who participated in the discussion were W. G. Hume, vice president, Keystone Steel & Wire Co., Peoria, Ill.; W. T. Kyle, Page Steel & Wire Co., Bridgeport, Conn.; J. E. Webster, DuCommon Corp., Los Angeles; J. S. McDaniel, secretary, Cordage institute, New York; Charles H. Meigs, commissioner, Fire Extinguisher institute, New York; W. P. Jeffrey, Hack Saw Manufacturers association, New York; J. H. Woodhouse, Carr Chain Works, Troy, N. Y; H. W. Caldwell, Hibbard, Spencer & Bartlett Co., Chicago; Charles W. La Port, Keystone Steel & Wire Co., Peoria, Ill; H. A. Roemer, president, Continental Steel Corp., Canton, O.; E. L. Parker, president, Columbia Steel & Shafting Co., Pittsburgh, and others.

According to Magnus W. Alexander, president of the National Industrial Conference board, New York, who was the speaker after the dinner Thursday evening, the distribution problem is in the first instance essentially a production problem. "Distribution," he declared, "involves much more than transportation, marketing and handling. We must examine the issue, not from the standpoint of the individual producer alone, but from the broad viewpoint of national economy. It is seldom recognized that the distribution problem goes much deeper and in fact has its roots in production. Faultily planned production cannot be rectified, although in part it may be corrected, by even the most excellently planned marketing program, a fact evidenced in the failure of many carefully designed and strongly financed advertising and sales campaigns."



MAGNUS W. ALEXANDER
Who said:

"The distribution problem is in the first instance essentially a production problem."

"There can be no over-production," Mr. Alexander declared, "because there is practically no limit to consumption, with the important proviso, however, that there is an infinite and ever increasing variety of commodities and in view of the vast potential markets to be opened up by the gradual improvement of living standards of the world's population now living on the fringes of what we choose to consider as civilization in Europe and in America. But there certainly can be over-production of any one given variety of commodity at any given time. It is therefore in the planning of what to produce that the fundamental solution of the distribution problem lies."

Jobbers and retailers, Mr. Alexander indicated, are not necessarily to blame for the mounting costs of distribution, as they are called upon by their customers for increasingly elaborate service, and he cited statistics to prove that the average ratio of profits to receipts is considerably smaller in trade than in manufacturing and other lines of business activity.

Ascribing the national prosperity enjoyed by the United States during the past decade in large measure to industrial productivity and the elimination of economic waste in production through mechanization, he asserted that rationalization of the distributive process, combined with careful production planning, should result in further substantial economic gain.

(*Continued on Page* 62)

Seventeen Industries Represented on Committee

Manufacturers' Chairmen

Bolt, nut and rivet industry:
Charles J. Graham, president, Bolt, Nut and Rivet Manufacturers' association, Pittsburgh, chairman.

Horseshoe and calk industry:
Ross R. Harrison, general manager, Bryden Neverslip Co., New Brunswick, N. J.

Nail industry:
Geo. W. Jones, general sales manager, Pittsburgh Steel Co., Pittsburgh.

Fence industry:
Wm. G. Hume, vice president and sales manager, Keystone Steel & Wire Co., Peoria, Ill.

Electrical industry:
W. E. Sprackling, president, Tubular Woven Fabric Co., Pawtucket, R. I.

Hacksaw industry:
William E. Cross, Clemson Bros., Middletown, N. Y.

Hand tool industry:
Fayette R. Plumb, president, Fayette R. Plumb Inc., Philadelphia.
S. Horace Disston, vice president, Henry Disston & Sons Inc., Philadelphia.

Wire cloth industry:
George E. Watson, vice president and general sales manager, Wickwire-Spencer Steel Co. Inc., New York.

Wheelbarrow industry:
H. E. Haiman, General Wheelbarrow Co., Cleveland.

Valve and packing industry:
James R. White, secretary, Jenkins Bros., New York.

Cap and set screw industry:
H. E. Penfield, Chicago Screw Co., Chicago.

Cordage industry:
J. S. McDaniel, secretary, Cordage institute, New York.

Abrasive industry:
William MacGregor, Carborundum Co., Niagara Falls, N. Y.

Welded chain industry:
Frank A. Bond, vice president, United States Chain & Forging Co., Pittsburgh.

Fire extinguisher industry:
Charles H. Meigs, commissioner, Fire Extinguisher institute, New York.

Cold finished steel industry:
E. L. Parker, president, Columbia Steel & Shafting Co., Pittsburgh.

Shovel industry:
G. L. Butts, manager of sales, Wood Shovel & Tool Co., Piqua, O.

Jobbers' Chairmen

R. H. Welton, Chase, Parker & Co., Boston, chairman.
W. W. French, Moore-Handley Hardware Co., Birmingham, Ala.
H. L. Gray, Simmons Hardware Co., St. Louis.
H. W. Caldwell, Hibbard, Spencer & Bartlett Co., Chicago.
W. E. Hansen, Hansen & Yorke Inc., New York.
George Puchta, Queen City Supply Co., Cincinnati.
Fitzwilliam Sargent, Standard Supply & Equipment Co., Philadelphia.
H. H. Riddle, George Worthington Co., Cleveland.
D. D. Peden, Peden Iron & Steel Co., Houston, Tex.
Henry Morris, Northern California Hardware Jobbers association, San Francisco.
P. R. Helm, Pratt-Gilbert Hardware Co., Phoenix, Ariz.
H. V. Waterman, Hendrie & Bolthoff Machinery & Supply Co., Denver.
Alvin M. Smith, Smith-Courtney Co., Richmond, Va.

Industrial Men in the Day's News

S. T. Johnston, New President, American Foundrymen's Association

Photo by Blank-Stoller Inc.

HAVING been associated with the foundry group since its inception, as its president he has a clear understanding of its problems.

IN CIVIC affairs he has always maintained great interest, and he is known by nearly all the residents of the suburban town in which he lives.

GOLF is his favorite pastime, although he takes part in promoting all recreational activities in his community.

CONNECTED with the activities of the American Foundrymen's association ever since its inception in 1896, Samuel T. Johnston was elected to its highest office, that of president, at the convention held in Philadelphia in May. For the past two years Mr. Johnston has served as a vice president of the association.

Born and educated in Scotland, Mr. Johnston came to the United States as a young man in 1889, obtaining a position in Detroit under J. H. Whiting, who was at that time general superintendent of the Detroit Car Wheel Co. Later, upon the organization of the Detroit Foundry Equipment Co. by Mr. Whiting, Mr. Johnston was employed as a salesman. For 10 years Mr. Johnston continued in this position with Mr. Whiting, and then became associated with S. Obermayer Co., Chicago, where he has remained ever since.

He served in various capacities for the Obermayer company, and he has been vice president and general manager for several years. Recently he was elected vice president of the National Engineering Co., Chicago.

Mr. Johnston's connections with foundry associations began when he became identified with the Western Foundrymen's association, and in 1896 he was elected secretary of that group. When the organization joined the Philadelphia Foundrymen's association in the movement to organize a countrywide association he was one of the signers of the joint invitation sent out calling a meeting in Philadelphia in May, 1896, that led to the formation of the American Foundrymen's association that year. Mr. Johnston is a charter member of the association and has been present at every convention it has held.

The Foundry Supply association was organized in 1906 to handle exhibits at the conventions and he was elected its first president. In 1908 he was elected a vice president of the American Foundrymen's association, and when the group applied for a charter eight years later, Mr. Johnston was one of the signers of the application. He was elected a director and served continuously for eight years. At one time, Mr. Johnston was a president of the Foundry Equipment Manufacturers' association, and has been connected closely with its development. Mr. Johnston has always taken an active part in civic, social and community affairs of Riverside, Ill., a suburb of Chicago, where he has resided for more than a score of years and where he is known by virtually every resident. He has served two terms as president of the board of education, as a member of the Riverside board of trustees, and has been president of the Riverside Golf club for two terms. He also is a trustee of the Riverside Presbyterian church.

Some years ago the Riverside Men's club was formed from the brotherhoods of three churches, the membership of which has been extended to include practically all men of the community. Mr. Johnston has been active in the organization and work of this group and has served as its head.

One of his chief recreations is golf, but he takes part in promoting all recreational activities undertaken in his community. For a number of years he has been active in helping to organize various patriotic observances, pageants and celebrations.

Men of Industry

Personal News of a Business Character Pertaining to the Iron and Steel and Related Fields of Enterprise

WILLIAM J. OLCOTT, for 19 years president of the Oliver Iron Mining Co., Duluth, has resigned. He was graduated from the University of Michigan in 1883. He became associated with the Chapin mine, Iron Mountain, Mich., in 1885, and in the following year went to the Germania and Ashland mines as

WILLIAM J. OLCOTT

chemist and engineer, remaining there until 1890. On formation of the United States Steel Corp. in 1901 he became general manager of all the iron mines in the Lake Superior district, the operating company being the Oliver Iron Mining Co. He was made vice president of the Oliver company in 1905 and four years later he was elected president.

Pentecost Mitchell, vice president of the Oliver company, has been named to succeed Mr. Olcott as president.

* * *

Leonard E. Schlemm has been added to the board of directors of the Algoma Steel Corp. Mr. Schlemm, who is a civil engineer, has practised as a consulting engineer in Montreal for the past 18 years.

* * *

Stanley M. Neal, formerly sales manager of the New Haven Sherardizing Co., Akron, O., has resigned to become associated with the sales organization of the H. A. Montgomery Co., manufacturing chemist, Detroit.

* * *

George C. Beach, president, Steel Furnaces Corp., New York, is in Europe, to return about the middle of August.

* * *

James Lenahan, purchasing agent of the Link-Belt Co., Nicetown, Philadelphia, will sale July 21 for a vacation in Europe.

* * *

H. F. Guthrie, formerly with the Mansfield Vitreous Enameling Co., Mansfield, O., is at present associated with the Louisville Enameled Products Co., Louisville, Ky.

* * *

E. T. Weir, president, Weirton Steel Co., Weirton, W. Va., and Steubenville, O. has been elected a director of the American Iron and Steel institute, New York.

* * *

S. L. Gabel, president, Summerill Tubing Co., Bridgeport, Pa., recently rode the air mail plane from Hadley Field to Cleveland to obtain first hand impressions of air transportation possibilities. The Summerill company is active in the aircraft industry.

* * *

I. Thompson, formerly in charge of the enameling department of the Wehrle Stove Co., Newark, O., has become associated with the Ferro Enamel Supply Co., Cleveland. Prior to his connection with the Wehrle company, Mr. Thompson was with the enameling division of the American Stove Co. at Cleveland.

Carl J. Reiff, who has had charge of the porcelain enameling department of the Estate Stove Co., Hamilton, O., became associated with the Ferro Enamel company July 1.

* * *

Blaine S. Smith, vice president of the Universal Portland Cement Co., New York, has resigned to become president of the Pennsylvania-Dixie Cement Corp., to succeed John A. Miller. Mr. Miller has been made chairman of the corporation. Mr. Smith is a member of the American Society for Testing Materials, Western Society of Engineers and American Iron and Steel institute.

* * *

Oscar E. Epp, formerly secretary, treasurer and a director of the Batavia Steel Plate Construction Co., Batavia, N. Y., is treasurer and general manager of the Safety Auto Signal Co., 1517 South Michigan boulevard, Chicago.

OSCAR E. EPP

* * *

H. E. Henry, formerly vice president of the Commercial Tool Co., Cleveland, has resigned and is now representing the Ex-Cello Tool & Mfg. Co., Detroit, in Cleveland. He is also in charge of sales for the Active Machine & Tool Co., Cleveland.

* * *

Gustave W. Thompson, chief chemist since 1892 of the National Lead Co., was elected president of the American Society for Testing Materials at its meeting in Atlantic City, N. J., last week. In 1916 Mr. Thompson became a director and officer of a number of subsidiary companies of the National Lead Co. He is a member of the American Chemical Society; the American Institute of Chemical Engineers, of which he was

president in 1918; the Chemists Club of New York, and other organizations. He became associated with the American Society for Testing Materials in 1903 and was elected vice president in 1926.

Paul Dyer Merica was elected a member of the executive committee of the American Society for Testing Materials at its meeting last week. Since 1922 Mr. Merica has been director of research of the International Nickel Co., New York, with which he became associated in 1918 as physical metallurgist and superintendent of research, at Bayonne, N. J. He is a member of numerous technical organizations.

* * *

Edwin R. Wegener, for the past 16 years with the Ford Motor Co., Detroit, in the steel and forging division, has been appointed general manager of the Detroit Forging Co., Detroit.

* * *

Ludwig Kemper has been made president of the Cincinnati Ballcrank Co., Cincinnati, succeeding Clifford Green, who has been made chairman of the board. Mr. Kemper was at one time treasurer of the Otis Steel Co., Cleveland.

* * *

R. F. Schuchardt, electrical engineer, Commonwealth Edison Co., Chicago, has been elected president of the American Institute of Electrical Engineers, for the year beginning Aug. 1, 1928, as announced at the annual meeting of the institute at Denver, June 26.

* * *

Boyd Emerick, formerly assistant foundry superintendent of the Corry, Pa., plant of the United States Radiator Corp., has been made superintendent of the plant, succeeding Clyde E. Weir, who was transferred to the Dunkirk, N. Y., plant, as noted in IRON TRADE REVIEW, issue of May 3. For the past three years, Mr. Emerick has been at Geneva, N. Y., as foundry superintendent of the Radiator corporation plant there.

* * *

Fred C. Young, district manager of the Cleveland territory for the Union Drawn Steel Co., Beaver Falls, Pa., has been appointed assistant general manager of sales, effective July 2. Mr. Young enters a position just created, as assistant to George B. Mitchell, vice president in charge of sales. Mr. Young has been affiliated with the Union Drawn company almost 14 years, and before opening the Cleveland office about ten years ago, had represented that company in Detroit.

A. C. Geldner, assistant to Mr. Young in the Cleveland district for the past five years, has been appointed to succeed Mr. Young as Cleveland district manager.

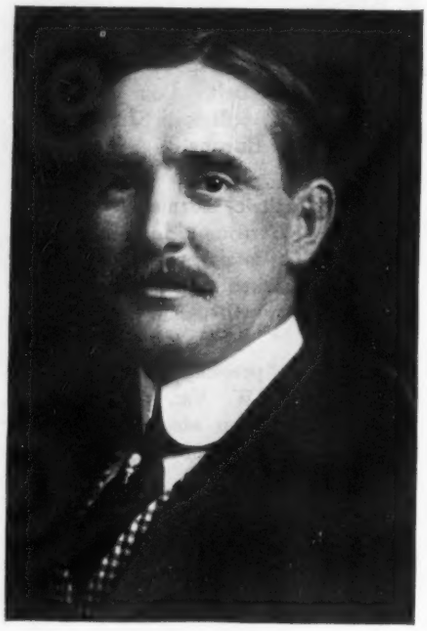
* * *

W. H. Gerhauser, vice president and secretary of the American Ship Building Co., Cleveland, has been elected president to succeed Alfred G. Smith, whose death was noted in IRON TRADE REVIEW, issue of June 7. Mr. Gerhauser is only 39 and a son-in-law of M. E. Farr, formerly president of the company and who was succeeded by the late Mr. Smith.

G. W. Cottrell, general counsel of the company, has been elected vice president and R. B. Ackerman, auditor, has been made acting secretary.

* * *

J. Ramsey Speer, whose resignation as president of Mackintosh-Hemphill Co., Pittsburgh, was announced in IRON TRADE REVIEW last week, is a graduate of Massachusetts Institute of Technology, Boston, and has been actively connected with the iron and steel industry ever since leaving college. He was chairman of the board of the Pittsburgh Iron & Steel Foundries Co. prior to his connection with the Mackintosh-Hemphill Co. In 1923 he was elected president and treasurer of the Mackintosh company succeeding George S. Macrum.



J. RAMSEY SPEER

D. L. Mathias, who has resigned as advertising manager of the Mackintosh company as noted last week, is not yet ready to announce his further plans. Mr. Mathias, after graduating from Carnegie Institute of Technology in 1914, became identified with the Brown Instrument Co., Philadelphia, as pyrometer engineer in the Pittsburgh district working out of its Pittsburgh office. He then was affiliated for six years with the metallurgical and sales departments of the Mackintosh-Hemphill Co., leaving that connection to become editor of Blast *Furnace and Steel Plant*, and *Forging & Heat Treating*, published by the Andresen Co., Pittsburgh. About a year and a half ago he resigned to return to the Mackintosh company as advertising manager.

F. Hughes Moyer, vice president of the company, is actively in charge until reorganization takes place.

Obituaries

JOHN P. BARDER, 53, general superintendent of the Biggs Boiler Works Co., Akron, O., died in that city June 19. He was a lifelong resident of Akron and had been with the Biggs company for 34 years, 25 of which he spent as general superintendent.

* * *

William H. Whipp, formerly assistant superintendent of the Gorham Mfg. Co., Providence, R. I., died in that city last week. He retired from active connection with the Gorham company in 1920.

* * *

Elmer J. Remensnyder, 44, assistant purchasing agent, Pennsylvania railroad, died in Philadelphia, June 27. He was born in Pittsburgh in 1883 and entered the service of the Pennsylvania railroad in 1901, at Pittsburgh.

* * *

Hjalmar Osterberg, 59, special agent for the tin plate division of the Wheeling Steel Corp., Wheeling, W. Va., died June 25. He was born in Stockholm, Sweden, coming to this country when a boy. He worked his way upward through the various sheet and tin mills in the Pittsburgh district, finally becoming associated with the American Sheet & Tin Plate Co. He organized the Osterberg Tin Plate Co. at Waynesburg, Pa., which was abandoned in 1913. He went with the new Wheeling Sheet & Tin Plate Co. in that year.

Radiator Plant Down

Birmingham, Ala., July 3.—The American Radiator Co. has closed its local plant for two weeks for repairs and to permit vacations. Operations will be resumed July 16.

Hardened and ground steel rolls were manufactured in this country in 1869 by Miller, Barr & Parkin Co., Pittsburgh, for the United States mint.

Continent Is Less Competitive

Only Beams, Whose Delivery Is Delayed, Are Factors in British Markets—50,000 Tons of Tunnel Segments Placed—Three Stacks Blown Out—India and South America Buy Tin Plate—India in Market for Blooms

European Headquarters,
IRON TRADE REVIEW,
Caxton House, Westminster, S. W.1

LONDON, July 2.—(*By Cable*)—Lincolnshire steelmakers are busier. The Stanton Iron Works has been awarded 50,000 tons of iron segments for the Mersey tunnel. Special steels are fairly active. Easier continental prices are scarcely competitive, except those on beams, but deliveries are uncertain. Pig iron continues dull, with three stacks blown out. Galvanized sheet demand is improving with good orders from India and South America. Tin plate orders are satisfactory and the outlook is good; the scheme to restrict output has been suspended.

Japan is inquiring for fair tonnages of ship plates. Brussels reports export trade quieter and prices easier. Antwerp dock employes are striking, causing anxiety concerning shipments, some of which are being diverted to Dunkirk. From Paris comes word that exports are easier, domestic demand continues good and producers are well booked. German conditions are largely unchanged. India is inquiring for a large tonnage of blooms.

British Steel Holds Advantage Over Continent

BIRMINGHAM, Eng., June 22.—(*European Staff Service*)—A close watch is still being kept on steel prices, the idea being that the earliest opportunity should be taken to declare an advance. A further meeting of steelmakers in London this week decided that the fitting moment had not arrived. It is a somewhat novel experience for the British steelmaker to find himself able to fight the foreigner on reasonably equal terms, and he is not disposed to throw away the advantage.

The industry is, apparently, stabilizing, and better able to command British business, although the improvement is anything but spectacular. The only change this week in foreign prices is a rise of 1s ($.24) per ton on all sizes of plates. A good deal of steel has still to come in on old contracts. Billets at £5 15s ($28.06) and No. 3 Belgian iron at £6 13s ($32.44) have little attraction for British users.

Sterling—$4.88

The most important effect of the rise in foreign billets is that British steel is now being ordered from our own works, and the rerolled bars are no longer subject to the reproach that though turned out of a British mill they are foreign. The firmness of foreign prices has caused much surprise.

The most depressing department is that of pig iron. The Midlands have been reducing output since the beginning of the year, and the New Cransley company of Kettering will blow out its furnace within the next few days. The cause is not entirely economic, as the plant is badly in need of repair, but with large stocks on hand the furnace can only too well be spared. A short time ago, the Midland furnaces had a sort of working understanding as to prices, which for a time was well maintained, but this now seems to have been thrown to the winds, and a period of keen price cutting has commenced. The Stanton Iron Co., which has shown great enterprise in the last few years in the manufacture of rotary cast pipes, has lately completed some new furnaces, and for the present has surplus pig iron to sell. Other smelt-

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, July 2	*British* Gross Tons U. K. Ports		*French* Metric Tons Channel Ports		*Belgium and Luxemburg* Metric Tons Channel Ports		*German* Metric Tons Rotterdam or North Sea Port	
Export Prices f. o. b. Ship at Port of Dispatch—By Cable								
PIG IRON		£ s d		£ s d		£ s d		£ s d
Foundry No. 3, Silicon 2.50-3.00	$16.10	3 6 0*	$15.37	3 3 0	$15.37	3 3 0	$15.62	3 4 0
Basic	15.86	3 5 0	14.64	3 0 0	14.64	3 0 0	15.37	3 3 0
Basic-bessemer	16.84	3 9 0†	14.64	3 0 0	14.64	3 0 0	14.64	3 0 0
Hematite, Phosphorus 0.02-0.05	16.84	3 9 0	22.20	565*	.....	.....	17.08	3 10 0
SEMIFINISHED STEEL								
Billets	$29.28	6 0 0	$23.06	4 14 6	$23.06	4 14 6	$23.67	4 17 0
Wire rods	42.70	8 15 0	29 28	6 0 0	29.28	6 0 0	29.28	6 0 0
FINISHED STEEL								
Standard rails	$37.82	7 15 0	$31.11	6 7 6	$31.11	6 7 6	$31.11	6 7 6
Merchant bars	1.53c	7 0 0	1.24c	5 13 0	1.24c	5 13 0	1.27c	5 15 0
Structural shapes	1.61c	7 7 6	1.06c	4 16 0	1.06c	4 16 0	1.08c	4 18 0
Plates, ship, bridge and tank	1.77c	8 2 6	1.39c	6 6 0	1.39c	6 6 0	1.41c	6 8 0
Sheets, black, 24 gage	2.18c	10 0 0	2.31c	10 10 0	2.31c	10 10 0	2.18c	9 18 0
Sheets, galvanized, 24 gage, corrugated	2.91c	13 7 6	2.89c	13 2 6	2.89c	13 2 6	2.92c	13 5 0
Bands and strips	2.23c	10 5 0	1.46c	6 12 6	1.46c	6 12 6	1.43c	6 10 0
Plain wire, base	2.12c	9 15 0	1.54c	7 0 0	1.54c	7 0 0	1.67c	7 12 0
Galvanized wire, base	2.94c	13 10 0	1.98c	9 0 0	1.98c	9 0 0	2.00c	9 2 0
Wire nails, base	2.51c	11 10 0	1.62c	7 7 6	1.62c	7 7 6	1.65c	7 10 0
Tin plate, base box 108 pounds	$ 4.51	0 18 6	.....	.....	.....	.....	$ 6.83	1 8 0

*Francs

Domestic Prices at Works or Furnace—Last Reported			Francs		Francs		Marks	
Foundry No. 3 Pig Iron, Silicon 2.50—3.00	$16.10	3 6 0	$17.49	445(2)	$16.46	590	$18.64	78
Basic pig iron	15.86	3 5 0	18.86	480(1)	15.07	540	21.03	88
Furnace coke	3.17	0 13 0	5.90	150	5.16	185	5.14	21.50
Billets	29.28	6 0 0	22.20	565	23.72	850	28.92	121
Standard rails	1.74c	8 0 0	1.48c	820	1.43c	1,100	1.51c	140
Merchant bars	1.55c	7 2 6	1.23c	685	1.33c	1,025	1.52c	141
Shapes	1.72c	7 17 6	1.17c	650	1.19c	915	1.49c	138
Plates, ship, bridge and tank	1.89c	8 12 6‡	1.51c	840	1.48c	1,140	1.71c	158
Sheets, black, 24 gage	2.29c	10 10 0	2.74c	1,520	2.44c	1,880	2.43c	225
Sheets, galvanized 24 gage, corrugated	2.91c	13 7 6	3.42c	1,900	2.99c	2,300	3.78c	350
Plain wire	2.12c	9 15 0	1.71c	950	1.95c	1,500	2.48c	230
Bands and Strips	2.23c	10 5 0	1.40c	775	1.76c	1,350	1.77c	164

*Middlesbrough; †Scotch foundry iron; ‡delivered; (1) Basic-bessemer; (2) Longwy. British export furnace coke £0 13s 0d ($3.17) f. o. b. Ferromanganese £21 10s 0d ($104.92) delivered Atlantic seaboard, duty paid. German ferromanganese £15 0s 0d ($73.20) f. o. b.

The equivalent prices in American currency are in dollars per ton for pig iron, coke, semi-finished steel and rails; finished steel is quoted in cents per pound and tin plate in dollars per box. British quotations are for basic open-hearth steel; French, Belgian, Luxemburg, and German are for basic-bessemer steel.

ers strongly complain that Stanton iron is underselling other brands of Derbyshire and Northampton by 2s ($.48) per ton. The trouble is that there is more pig iron than can be disposed of, and the outlook is therefore gloomy.

Middlesbrough appears to be one of the strongest areas, having obtained relief from the pressure of Continental competition, and resumed service of important Continental areas.

In Barrow, output continues in excess of the demand, and stocks are becoming the subject of anxiety. Prices incline to weakness, and there is the possibility of curtailment of production. Fairly good sales are being made to other steelmaking areas. One undoubted advantage of the iron trade is the moderate price of fuel affecting all departments.

Galvanized sheets are inclined to firmness up to £13 10s ($65.88). The figure of £13 7s 6d ($65.27) appears to be a bottom price. Orders have come in rather more regularly lately, very good contracts being made with the West Indies, South and West Africa and Australia.

Steel scrap remains firm at £3 7s 6d ($16.47) delivered South Wales, but efforts to get an additional 2s 6d ($61) have not been successful.

The tin plate trade is rather quieter and the statistical record is not quite so good as a month ago, the tin plate mills in operation numbering 321, a reduction of 63 in the month. Unemployment, however, has not become serious. This week, tin values reduced by about £6 ($29.28) in two days, and this checked any tendency to advance prices. Tin plates are firm on a basis of 18s 6d ($4.52) but it is difficult to get quick deliveries, most mills being filled to the end of August. The drop in tin, however, will suffice to arrest the upward tendency, and may in the long run prolong the period of activity. A strong element in the market is the firm price of semifinished steel. Some steelmakers are charging £6 ($29.28). A few foreign bars are coming in at £5 7s 6d ($26.23) delivered.

German Steelmakers Make Profit

BERLIN, June, 20.—(*European Staff Service*)—The monthly report of the Stahlwerksvarband states that domestic business in semifinished products improved during May. Export business was satisfactory and prices were higher than in the preceding month. In structural steel considerable orders were received in April in anticipation of the rise in prices, with the result that May business was less active. The same applies to merchant bars. However, new business again is beginning to come in and export trade is satisfactory. In hoops and bands the situation is satisfactory, while numerous orders have been received both from the home and export markets for plates. Important contracts have been received from German shipyards. The tube union states that in May business was animated and the volume of domestic trade was greater than in April. In the export markets Germany has to meet British and American competition, and apart from orders for special tubes, the export situation is not satisfactory.

The Mannesmann tube company has issued its report for the financial year 1927, and it is stated that business has been on the increase. The concern owns collieries that have produced 4,100,056 tons of coal, and they also have produced 773,865 tons of coke. In general, the works have been well occupied. It is stated, however, that large quantities of tubes have been imported, especially from Great Britain, and that the present duty on imported tubes does not sufficiently protect the home industry. The continental tube syndicate reached an agreement with Poland in November, 1927, but all attempts to include British makers have failed.

The welded tube union has increased its sales by 22 per cent, but the seamless tube union has been disrupted. The new works of Huckingen, which comprise blast furnaces, basic bessemer plant and other works, will commence operations at the end of the current year. The share of the concern in the British Mannesmann Tube Co. now is 40 per cent, and it is reported that the financial year ending June 30, 1927, at the British company, resulted in a loss. The concern also owns 40 per cent interest in the Acieries et Usines a Tubes, of Paris, which declared no dividend for the past financial year, but made a sufficient trading profit to proceed with a number of amortizations.

After deducting 7,490,000 marks ($1,780,000) for amortizations, the Mannesmann company made a profit of 15,740,000 marks ($3,750,000) during the year 1927. A dividend of 8 per cent will be distributed on the ordinary shares, and dividends of 6 and 7 per cent on the preferred.

Belgian Imports in New High Record

Brussels, June 19.—(*European Staff Service*)—Imports of pig iron into Belgium and Luxemburg in March were the highest since the end of the war. Imports of steel in March were below those of February.

Steel exports consisted principally of shapes, 66,337 tons, plates and sheets, 62,254 tons, semifinished products, 62,202 tons, wire products, 32,280 tons, hoops and bands, 15,162 tons, and nails, bolts, nuts, etc., 13,915 tons. The March figure also includes 22,897 tons of scrap. The following table gives comparisons in metric tons:

	IMPORTS		EXPORTS	
Mon. ave.	Pig iron	Steel	Pig iron	Steel
1925	27,095	15,860	8,060	242,325
1926	27,505	27,265	13,105	304,075
1927	31,760	27,715	11,350	387,415
1928				
Jan.	37,625	34,357	6,793	289,854
Feb.	40,293	37,481	7,952	401,502
March	43,612	31,294	11,971	458,377

Belgian Prices at Export Limit

BRUSSELS, June 20.—(*European Staff Service*)—At the meeting of the Brussels iron and steel exchange June 6 the prices were those previously quoted, but it was clearly apparent it would be difficult to move them up or down. Indeed, buyers were scarce, and sellers did not want to commit themselves far ahead. However, the quotations were high, and, the differences between continental and English prices being rather insignificant, the firms abroad soon would have no advantage in buying on the continent in the event of a further increase. At present the works can hardly offer quick delivery, and in most cases their commitments extend over two or three months. Belgian iron and steel industries are working under favorable conditions, and the increase in wages granted on June 1 will not affect their situation. For a long time the metallurgists claimed that the cost of living had seriously increased, and last year a strike was feared, but it was delayed; the question now is settled, and the workmen seem satisfied.

Quotations were not so firm at the meeting of June 13, and there was some weakness, especially in respect of merchant bars, and whereas the official price remained at £5 15s ($27.85), orders were transacted at £5 14s 9d ($27.79). It is expected that bars will be sold at £5 14s 6d ($27.73) at the next meeting. However, producers were not disposed to accept all orders, but continued to select what was most convenient for their rolling programs.

It is possible that prices will fluctuate, but they will not move far from the actual level. The Usines Métallurgiques du Hainaut have booked orders for 2-inch billets at £4 18s ($23.72) f.o.b. Antwerp, and a French works has accepted 7-inch blooms of ordinary Thomas steel at £4 6s ($20.84). Some other French plants are in the market either for pig iron or semifinished steel. The official price for blooms is £4 8s ($21.32) f.o.b. Antwerp. Two-inch and 2½-inch billets are £4 17s ($23.48), and 3-inch and 4-inch billets are £4 14s ($22.76). Sheet bars are quoted at £4 18s 6d ($23.84). The average price for merchant bars is £5 14s 9d ($27.79). French and German works are selling some tonnages. Beams are £4 18s 6d ($23.84) for normal sizes, and £5 ($24.25) for British sizes.

Steel Castings Orders Heavier in May

Washington, July 3.—Orders for commercial steel castings in May totaled 84,824 tons, compared with 83,737 tons in April, according to reports to the department of commerce. Production in May totaled 91,638 tons compared with 85,669 tons in April. Output in May was at 63 per cent of capacity compared with 59 per cent in April and 60 per cent in May, 1927. Comparisons follow:

	BOOKINGS		PRODUCTION	
Total	†Total net tons	Railway specialties	†Total net tons	Railway specialties
1926	1,035,778	404,945	1,135,955	427,016
1927				
May	72,744	28,946	86,942	35,236
Total, 5 mos.	446,291	190,721	460,456	185,016
June	90,898	39,455	87,767	34,596
July	74,246	31,011	79,726	32,576
Aug.	63,528	21,144	87,004	32,397
Sept.	52,351	18,396	70,024	25,618
Oct.	51,748	16,625	62,409	21,947
Nov.	62,683	27,639	58,997	19,146
Dec.	76,953	39,112	58,220	19,358
Total	918,698	384,103	964,603	370,654
1928				
Jan.	91,072	41,276	74,082	28,714
Feb.	90,677	41,096	87,323	37,719
March	*83,285	30,992	*93,521	38,448
April	*83,737	*32,810	*85,669	32,619
May	84,824	34,954	91,638	36,553
Total 5 mos.	433,595	181,128	432,233	174,858

†For tonnage of miscellaneous castings deduct Railway Specialties from this total.
*Revised.

Furniture Orders Gain

Washington, July 3.—New orders for steel furniture in May made a good gain over April, department of commerce statistics show. Monthly comparisons follow:

	Business Group		Shelving	
1926	Orders received	Shipments	Orders received	Shipments
Total	31,393,171	31,429,140	7,340,351	7,837,017
1927				
May	2,381,369	2,528,672	686,144	585,397
Total, 5 mos.	13,812,453	13,876,272	3,232,206	3,117,543
June	2,369,244	2,519,512	638,485	657,927
July	2,091,804	2,040,209	534,592	564,744
Aug.	2,381,889	2,474,854	592,353	604,107
Sept.	2,367,857	2,218,602	607,905	531,154
Oct.	2,410,552	2,379,557	551,259	619,293
Nov.	2,476,230	2,856,181	574,763	590,764
Dec.	2,850,314	2,740,602	619,276	577,910
Total	30,760,343	31,105,789	7,351,122	7,264,282
1928				
Jan.	3,248,165	2,712,663	768,748	680,264
Feb.	3,295,861	2,908,527	741,310	681,999
March	3,283,329	3,169,351	841,098	831,607
April	2,915,344	3,065,637	740,658	716,104
May	3,085,365	3,213,018	732,921	768,562
Total, 5 mos.	15,828,064	15,069,196	3,824,735	3,678,536

Steel Employment Good

A fairly satisfactory level of employment was maintained in May in iron and steel, employment being afforded most of the workers in this industry, according to the United States employment service of the department of labor.

"Many of the basic industries of the country," says the service, "registered a further expansion in employment during May. Building operations expanded in all sections, providing employment for many additional skilled and unskilled workers.

"The automotive industry showed a marked upward trend and is now employing greatly increased forces. In the principal industrial centers many plants and factories reported fairly satisfactory operating schedules, employing their usual forces."

Malleable Castings Up

Washington, July 3.—May production of malleable castings increased substantially, according to figures supplied by the department of commerce. Monthly comparisons follow:

	Total tons produced	Per cent of capacity	Total tons booked	†Monthly capacity
1926				
Total	715,384	54.7	607,949	1,307,889
1927				
May	57,655	54.1	49,482	106,473
Total (5 mos.)	292,124	55.2	268,438	529,639
June	58,972	55.3	46,178	106,736
July	48,202	43.9	45,782	104,287
August	51,394	48.6	42,515	105,717
September	45,210	43.3	37,912	104,401
October	46,765	46.	39,494	101,606
November	40,845	40.5	34,624	100,778
December	47,876	47.6	49,215	100,685
Total (year)	631,388	50.4	564,158	1,253,849
1928				
January	54,818	59.6	53,153	92,015
February	59,045	63.8	55,452	92,498
March	63,322	69.6	60,697	91,043
*April	56,880	62.5	53,099	91,019
May	61,458	67.3	54,429	91,296
Total (5 mos.)	295,523	64.5	276,830	457,871

†Capacity during 1927 has been based on following formula: "Total number of units of molding floor space times average production per molder per day per unit of floor space, times number of actual working days per month." Beginning January, 1928: "Average monthly production for the best six consecutive months since Jan. 1, 1919, is to be taken as a practical monthly capacity."
*Revised.

Copper Tonnage Less

Smelter production of copper from domestic ores in 1927 was 1,684,040,983 pounds, a slight decline from the 1,739,622,094 pounds of 1926, states the federal bureau of mines. Refinery production of new copper in 1927 made a little over 3,000,000 pounds more copper available for consumption than in 1926. A decline of 67,000,000 pounds in refined copper imported and an increase of 80,000,000 pounds in that exported made a difference of 144,000,000 pounds in the supply available. Stocks of refined copper were 22,000,000 pounds larger at the beginning of 1927 than at the beginning of 1926.

Open-hearth checkers that give a rapid working furnace and maximum thermal efficiency will begin to clog from 200 to 250 heats.

Shipments of Manganese Ore Off in 1927

Shipments of manganese ore containing 35 per cent or more of manganese in 1927 totaled 44,741 long tons valued at $1,151,918, compared with 46,258 tons valued at $1,228,663 in 1926, states the federal bureau of mines. Shipments of metallurgical ore in 1927 amounted to 27,730 tons valued at $446,781 and chemical ore 17,011 tons valued at $705,137. This was an increase of 1200 tons in metallurgical ore and a decrease of 2700 tons in chemical ore.

New Mexico in 1927 shipped 56,624 tons of ore containing 10 to 35 per cent manganese, Colorado 26,828 tons, Georgia 20,015, Michigan 14,763 and Minnesota 6276. Manganese content of manganese ore imported in 1927 totaled 308,630 long tons valued at $8,487,016, contrasted with 347,378 tons valued at $11,071,131 in 1926.

By-Product Coke Gains

Production of by-product coke in May was 4,083,759 net tons, compared with 3,925,195 tons in April and 3,788,164 tons in May, 1927. The daily rate in May, 1928 was 131,734 tons and in May, 1927, 122,199 tons. Beehive coke production in May was 376,000 tons, compared with 377,000 tons in April and 630,000 tons in May, 1927.

Cumulative production of by-product coke from Jan. 1 to May 31 in 1928 was 19,694,163 tons, the largest in five years. Cumulative production of beehive coke in the same period was 1,968,000 tons, compared with 3,840,000 tons in 1927 and 5,597,000 in 1924.

By-product coke production by groups in May was as follows: New England, New Jersey and New York east of Buffalo district, 329,552 tons; Pennsylvania, Buffalo district and Ohio, 2,158,871; Alabama and Tennessee, 372,100; Illinois, Indiana, Michigan and Missouri, 1,055,590; Northwest and Far West, 167,646.

Thomas Stack Blown Out

Birmingham, Ala., July 3.—The Republic Iron & Steel Co. has blown out a Thomas blast furnace stack, leaving one of the three in operation. The stack will be relined.

A 6½ per cent wage increase has been granted to 22,500 locomotive engineers employed on the western railroads, which will add approximately $4,500,000 annually to payrolls of western carriers.

Schwab Approves Idea of Better Distribution

(*Concluded from Page* 55)

Pointing to social and cultural progress as manifested by higher living standards and the wider diffusion of education as concomitant phases of the increase in national prosperity effected by the intensive mechanization and rationalization of industry, Mr. Alexander said in conclusion: "Ours may rightly be called a machine civilization, but it should always be remembered that we owe to the machine both the leisure and the price for our cultural and social progress."

Ethics Not Created by Law

One of the outstanding addresses of the conference was delivered by Gilbert H. Montague, general counsel, National Welded Chain association of the United States, who spoke on the subject, "Recent Steps in Business Self-Government." According to Mr. Montague, business ethics are not created by law. "All the laws in christendom," he declared, "are powerless to raise the standards of business ethics beyond the balance arrived at by public opinion of the leaders in business." He also stated that trade associations are the only means of bringing to units in industry the necessity of raising the standard of business ethics.

Mr. Montague declared that the government recognizes the fact trade associations should be given a free hand and stated that the benefits accruing to business since 1925 as a result of the new freedom accorded trade associations can be measured in billioins of dollars.

James Francis Burke, general counsel, Bolt, Nut and Rivet Manufacturers association, Pittsburgh, spoke briefly on the relationship of the government to business. He stated he was in congress at the time the federal trade commission was established and felt at the time that its purpose was not only to impose certain restrictions but also to afford protection and opportunity for co-operation.

Mr. Burke then explained how the committees of jobbers and manufacturers authorized by the conference may work in co-operation with government agencies and with the advice of legal counsel in working out the practical details of the proposed plan of distribution.

Otis Steel Co. Expands

Cleveland, July 3.—In 90 days the Otis Steel Co. expects to complete enlargement of its soaking pit and blooming unit at its Riverside works, providing heating capacity for 7200 tons additional of steel ingots monthly. Finished steel capacity will be enlarged 2000 tons monthly by the installation of additional normalizing equipment, to be completed Sept. 1.

Pipe and Nipple Standards Are Adopted

Washington, July 3.—A general conference of manufacturers of pipe and pipe nipples and distributors and users of pipe nipples, held June 29 at the department of commerce under auspices of the commercial standards unit, bureau of standards, approved commercial standards for steel and genuine wrought iron pipe nipples.

The approved commercial standards decree that pipe nipples shall be made only from tested new full or short lengths and full weight steel pipe, free from buckles, bends, kinks, cracks, laminations, imperfect welds, rust, injurious sand marks or any other defects which might affect its strength or serviceability.

For steel pipe nipples the pipe shall otherwise conform in all respects with the A. S. T. M. tentative specification for welded and seamless steel pipe, while that for genuine wrought iron pipe nipples shall be in accordance with A. S. T. M. specification for welded wrought iron pipe No. A72-27.

The conference agreed that the effective date for new production and clearance of existing stocks should be Jan. 1, 1929. The commercial standards will be subject to annual review for revision by the standing committees. These committees, appointed by the general conference, are as follows; standing committee for steel pipe nipples; Raymond Groff, Pipe Nipple Standards Corp.; Crane Co.; Walworth Co.; Association of American Steel Manufacturers; James A. Messer Co.; Central Supply association; American Association of Heating and Ventilating Engineers; James B. Clow & Sons; National Association of Master Plumbers, and Standard Sanitary Mfg. Co. Standing committee for genuine wrought iron pipe: Raymond Groff, Pipe Nipple Standards Corp.; C. T. Ressler, Reading Iron Co.; James Aston, A. M. Byers Co.; James A. Messer Co.; Central Supply association; American Association of Heating and Ventilating Engineers; James B. Clow & Sons; National Association of Master Plumbers and Standard Sanitary Mfg. Co.

Set Standards on Lift Trucks and Skids

A proposed simplified practice recommendation for the dimensions of lift trucks and skid platforms has been approved by a general conference of manufacturers and users under the auspices of the division of simplified practice, the department of commerce.

The conference passed resolutions that two standard dimensions, 8 and 12 inches, be adopted for under clearance of skid platforms; and that "the minimum clearance between runners or supports of skids be not less than 29 inches." In addition the conference went on record as favoring establishment of standard dimensions for overall length and width of skid platforms, with the proviso that there be two standards, one to be such that this size of skid can be placed three abreast in a freight car, and the other the same length as the first skid but twice the width.

The conference agreed on a standard terminology for skid platforms as follows: Skid platforms—a platform of given size which is mounted on skids or legs, and which can be easily moved from place to place. Skid stock boxes—a platform of given size, which has closed sides and ends, forming the shape of a box and which is mounted on skids or legs, so that the same can be easily moved from place to place. Hand lift truck—a 3 or 4-wheel truck, the upper platform of which is adjustable to different heights, this adjustment being made by hand and the truck propelled by hand power. Power lift truck—a 3, 4 or 6-wheel truck, the platform of which is raised or lowered by power, and the truck and load it carries propelled by power.

This recommendation, subject to acceptance on the part of the interested elements of the industry, will become effective Oct. 1, 1928. It will be reviewed annually by the Standing Committee. The membership of this committee is comprised of Robert A. Lesher, (chairman); J. W. Gerber, Southern railway; R. C. Damon, national automobile chamber of commerce; C. B. Crockett, Society for Electric Development, W. A. Meddick, Lakewood Engineering Co.; Walter C. Stuebing, Stuebing Cowan Co.; and Edwards L. Leeds, of Leeds Co.

May orders for steel boilers totaled 1572, compared with 1325 in April, and 1419 in May, 1927, according to reports of 72 manufacturers to the department of commerce.

Machinery

June Activity Close Strong—Total Business for First Half Will Outdo That for Same Period Last Year by Nearly 50 Per Cent

CONTRARY to earlier expectations, activity in the machine tool and equipment market continued at a good pace during the last week in June. It is generally conceded that business for the first six months of 1928 is far ahead of that in the corresponding period of last year. In some cases the increase will amount to nearly 50 per cent. General buying is good for this season of the year. General Electric Co. continues to expand its list for equipment for its refrigerator manufacturing department at Schenectady. Westinghouse Electric & Mfg. Co., East Pittsburgh, will take prompt action on its third quarter list calling for about 80 items, but it is understood that the appropriation for purchases has been cut about half. Crane buying and inquiries have dropped off.

New York, July 3.—Interest in the local machine tool market is centered largely in requirements of the General Electric Co., Schenectady, N. Y., which continues to augment its list for its refrigerating department and one or two other fair-sized lists, including several machines long pending for the New York Central. Two large dealers here report better business this month than in May. A manufacturer in the Philadelphia district has purchased several engine lathes from Pratt & Whitney Co., which in fact, has sold 12 such machines to buyers in that district within the past week. This equipment includes five 13-inch, four 16-inch and three 20-inch lathes. Other equipment booked by this builder includes three 10-inch thread millers, two ⅝ by 4½-inch turret lathes, one rotary service grinder and one die sinker; also a used deep hole driller and a rebuilt jig borer. Niles Tool Works has booked a 10 by 16-foot extension boring machine, a 90-inch locomotive axle drill turning lathe and a 5-foot right line radial drill. The Coney Island & Brooklyn railway is inquiring for four machines, including a 16-inch engine lathe, a drill and a hack saw.

Worcester, Mass., July 3.—Machine tool business, while rather spotty, is in the aggregate satisfactory for this season as to total sales, and in places even shows improvement. Grinding machinery is in good demand. Textiles are still dragging. Automobile makers are fair buyers in this market. Sales of individual tools have continued good and inquiries over a diversified field are good. Small tools are in strong demand as are production lathes.

Pittsburgh, July 3.—Steady rather than spectacular buying is the feature of the machine tool trade. Purchases are confined to two or three needed items by scattered manufacturers. Carnegie Steel Co., having bought a planer and a saw for Duquesne works will shortly place orders, it is believed, for a lathe, radial drill and two or three other items. William K. Stamets reports the sale to a local pipe plant of some of its automatic pipe threading machines. Sales for this dealer for the first half are ahead of the first six months of last year by a fair margin, and sales for the month of June are ahead of June, 1927. The trade understands on good authority that the Westinghouse Electric & Mfg. Co. will take prompt action on its third quarter list, but that the appropriation for purchases thereon has been cut about 50 per cent. A list is expected soon from the Altoona, Pa., high school. It is understood that the Hoffman Machinery Co., Syracuse, N. Y., will need a few items for its new addition. Crane orders are scarce but several inquiries are pending, lending encouragement to that branch of the equipment trade.

Chicago July 3.—Most machine tool dealers in this territory are expecting that the June volume of business will show the best month's turnover in several years. This has been due largely to heavy purchases from the farm equipment and tractor manufacturers in the West. Aside from those projects, no large individual inquiries are before the market. Numerous inquiries continue to appear in the form of single tool proposals, and a good volume of inquiry has been shaping up in used tools, largely for tools that distributors of new equipment have in stock. Southern Pacific is asking bids on a punching shear and a 42-inch boring mill. Rock Island has added to its recent list with an inquiry for a 36-inch shaper.

Cleveland, July 3.—June activity persisted strong to the end, making the month show up well in contrast with recent months. Following a temporary lull in the second week, business picked up appreciably and continued on even keel to end. At the moment there is nothing to indicate either way as to what is in store for the next few months. The automobile industry is buying a little more freely, although the bulk of orders will come a little later in the summer as new models are more fully determined. One local manufacturer of special automotive equipment is understood to have taken an order for 15 cylinder finishing machines for a General Motors unit making a light car. The value of this equipment will amount to about $75,000. Used machinery is in steady demand.

CRANE ORDERS PLACED

Four 5-ton electric overhead cranes for West Virginia Pulp & Paper Co., New York, for installation at Covington, Va., to Shaw Crane-Putnam Machine Co. Cranes for Mechanicsville, N. Y., are still pending.

Among single orders were: 150-ton electric overhead crane for southern power plant, reported placed with Niles Crane Corp.; 1000-foot monorail system, equipped with one cab, for A. Schrader's Son Inc., Brooklyn, to George D. Morse, Brooklyn representative of tramrail division of Cleveland Crane & Engineering Co. This equipment is to facilitate window cleaning and is to be fastened to coping around two-thirds of building; it will be udylite plated to resist corrosion; 4-ton handpower crane for metal plant at Passaic, N. J., to New Jersey Foundry & Machine Co.; 10-ton trolley for Jones Bros. Structural Steel Co., Ravenna, O., to Shaw Crane-Putnam Machine Co.

CRANE ORDERS PENDING

100-ton electric overhead crane for a power plant in California, action expected shortly through Stevens & Wood Inc., New York, engineer in charge.

Overhead cranes and monorail equipment for a new foundry for U. S. Hoffman Machinery Corp., Syracuse, N. Y.; pending.

Three cranes, including 10-ton, 5-ton and 3-ton bridge crane for Link-Belt Ltd., Toronto, Ont.; pending.

Lake Coal Rate Effective on All Railroads

Pittsburgh, July 3.—The new lake port rate on coal from the Pittsburgh district went into effect on the Baltimore & Ohio and Pittsburgh & West Virigina railroads June 28 and became effective on the Bessemer & Lake Erie June 29. The rate went into effect on the Pennsylvania and Pittsburgh & Lake Erie roads June 18. The Baltimore & Ohio and Pittsburgh & West Virigina and Bessemer & Lake Erie were late in publishing the new rate, hence the delay in becoming effective. The new rate involved the latest cut of 20 cents per 100 pounds, granted recently by the northern coal roads from $1.46 to $1.26 to lake ports for shipments beyond the Detroit river or north from Port Huron, Mich., and Sarnia, Ont.

Lamme Medal Is Awarded

Pittsburgh, July 3.—Carrying out provisions in the will of the late Benjamin G. Lamme, for many years chief engineer of the Westinghouse Electric & Mfg. Co., the Society for the Promotion of Engineering Education, in session at Chapel Hill, N. C., last Thursday evening made the first award of the Lamme gold medal for "advancement of the art of technical training," to Dr. George Fillmore Swain, professor of civil engineering of Harvard university.

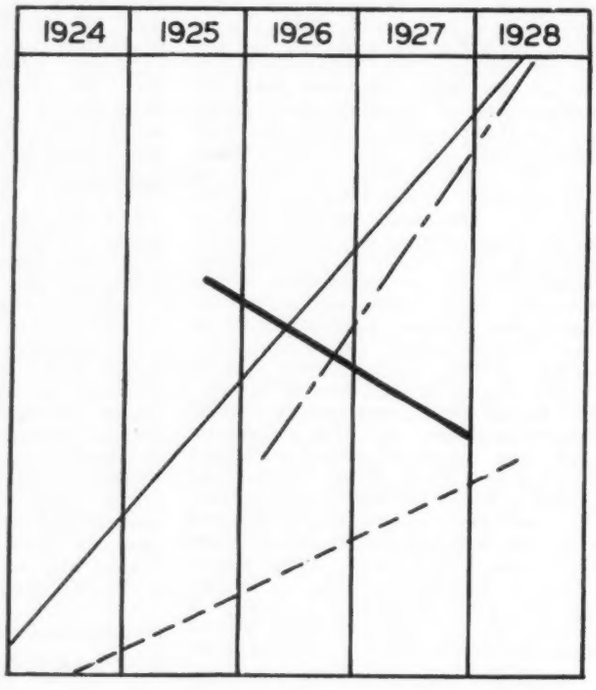
Does Decrease in Speculation Forecast Increased Production?

UNDER the caption "Looking Ahead," Alvan T. Simonds, president, Simonds Saw & Steel Co., Fitchburg, Mass., has written a discussion, illustrated with charts, on the possible connection between volume of speculation and the cost of credit and other business factors. In his statement for July, Mr. Simonds asks "Is increasing speculation followed by increasing money rates, and are these two increases followed by decreasing factory payrolls?"

After discussing trends in speculations, brokers' loans, money rates and factory payrolls in the period following the war, Mr. Simonds continues as follows:

"When money has been growing cheaper for a considerable length of time, and has finally reached as low a point as it did in the fall of 1924, speculation is already on the upward move and business soon follows it. Both of these upward movements have been caused by the downward turn in money rates, which began several months previous. Both keep on the upward trend for about the same length of time as money rates kept on the downward trend, and vice versa. In the fall of 1924 money rates turned upward and continued to increase until the fall of 1926. This increase in the cost of credit, although it was not great, was followed by business turning down at the beginning of 1926 and continuing downward in a major trend to the end of 1927. There was, of course, a seasonal rise in the spring of 1927, but money rates had gone so low in the fall of 1924 and the optimistic psychology of the crowd had developed to such an extraordinary degree, that speculation halted only for a brief period in the spring of 1926 and then shot upward like a sky rocket to June, 1928. Throughout most of this last movement, business was going down while speculation was going up sharply. Business is influenced by money rates; but the influence, though it is at work, does not show itself immediately. A decline in money rates shows itself in improved business, beginning some months later.

"What is going to be the effect upon factory payrolls, upon the amount of manufacturing done in the United States during 1928 and 1929, and possibly 1930 and 1931, of this four years' upward spurt in speculation? We make no prediction. We do not even claim that bull markets will always be followed by decreasing factory payrolls, and that bear markets will always be followed by increasing factory payrolls. We simply present the facts showing that increased speculation increases money rates, and that increased money rates are followed by increased industrial production, with decreased factory payrolls. The charts also show that decreased speculation is followed by decreased money rates, and this is followed by increased industrial production, with increased factory payrolls. If this is always the case, it makes little or no difference whether the one that comes first is the cause of the other or not. We have our own conviction in the matter. We are very sure that stock market speculation is now over inflated. Whatever may be the result upon industrial production of the present stock market inflation, the charts seem to prove that, after the boom has burst, and speculation begins to decrease in a major movement, this decrease will be followed somewhat later by an increase in business—in the volume of manufacture and in factory payrolls. The reader, however, may study the charts and form a belief for himself."



The light solid line represents volume of speculation; the dot and dash line, brokers' loans; the dotted line, money rates; and the heavy solid line, factory payrolls. Major trends only are shown

New York To Revise Its Building Code

New York, July 3.—With American Institute of Steel Construction standard specifications pending only the sanction of Mayor Walker for adoption in the local building code, it appears that time is not far off when the most important and one of the few remaining building districts of the country will have accepted these specifications.

The proposed amendment to the existing code is being urged by a number of well-known engineering organizations, as well as by individual engineers of high repute, and by the local merchants' association. A saving of $6,000,000 annually in the cost of local building operations would result, it is said.

The present building code, unrevised in 35 years, calls for a working stress of 16,000 pounds per square inch. Through improved methods of manufacture and through better control of the chemistry of steel, structural material can now carry safely, according to actual test, around 20,000 pounds working stress per square inch. However, the institute conservatively recommends a change to 18,000 pounds, or the equivalent to a saving of about 15 per cent in the quantity of steel used.

The institute's specifications, drawn up in 1923, have been accepted, it is said, by more than 135 of the larger cities, or by practically all with a population of more than 200,000.

Gets Cylinder Drawback

Washington, July 3.—The treasury department has granted a drawback on seamless steel high pressure cylinders manufactured by the Harrisburgh Pipe & Pipe Bending Co., Harrisburg, Pa., with the use of imported ferromanganese, fluorspar and ferrosilicon.

Officers recently elected by the Indianapolis chapter of the American Society for Steel Treating are as follows: Chairman, E. J. P. Fisher, Diamond Chain & Mfg. Co.; vice chairman, Carl Winkler, Schwitzer-Cummins; secretary, Nelson R. Gorsuch, Citizens Gas Co.; and treasurer, R. S. Smith, E. C. Atkins & Co.

CONSTRUCTION and ENTERPRISE

Concise Timely Business Building Opportunities from Field of Industry

North Atlantic

BOSTON—Meisel Press Mfg. Co., 944 Dorchester avenue, Dorchester, Mass., manufacturer of printing presses, is taking bids on an addition 100 x 220 feet.

BOSTON—Mid-West General X-Ray Co. has been incorporated with $100,000 capital to manufacture X-Ray surgical and medical apparatus and electrical appliances, by Laurence E. Gott, president and treasurer, Park Square building, Boston; Robert H. Montgomery, clerk, 30 Federal street, Boston; John N. Pernich, Boston.

BOSTON—Richards-Clark Motor Car Co. has been incorporated to manufacture motors, engines and machinery, with $75,000 capital and 500 shares no par value, by C. H. Richards, president, 1095 Commonwealth avenue, Newton Center, Mass.; Rodney G. Clark, 857 Commonwealth avenue, Boston, treasurer; M. E. Foley, clerk.

FALL RIVER .Mass.—Metal Bobbin & Shuttle Eye Co. Inc., Fall River, Mass. and Pawtucket, R. I., has been incorporated with $500,000 capital and 5000 shares no par value to manufacture bobbins, bobbin retainers, shuttles, shuttle eyes and spindles, by Lucien Heroux, president, 15 Ledge street, Central Falls, R. I.; Louis A. Cadoret, treasurer, 5 Manchester street, Pawtucket, R. I.; Preston H. Hood, Somerset, Mass.

SPRINGFIELD, MASS.—Froiland Chain & Mfg. Co., 2543 Main street, Paul Froiland, president, will build a 1-story plant 75 x 135 feet.

CARTERET, N. J.—Nizinite Metals Corp. has been incorporated with $200,000 capital by Emil Stremlau, Carteret.

JERSEY CITY, N. J.—Rome Bed Spring Co. has been incorporated with $5000 capital, by Levitan, Levitan & Auerbach, Jersey City.

NEWARK—A. & W. Trading Co. has been incorporated with 100 shares no par value to manufacture metal and alloys, by Braelow & Tepper, Newark.

NEWARK, N. J.—Steel Utilities Corp. has been incorporated to manufacture steel products with $100,000 capital, by David E. Bernstein, Newark.

NEWARK, N. J.—Turner Machine Co., 28 Eagle street, manufacturer of tanning machinery, will build a 1-story machine shop, 60 x 92 feet. General contract has been let to Enstice Bros., 111 Academy street.

NEWARK, N. J.—Universal Metal Box & Products Co., 144 Bleecker street, has leased a plant at 316 Coit street, which is being rebuilt for its occupancy, with 20,000 square feet of floor space. The company manufactures metal boxes for electrical installations.

NORTH HALEDON, N. J.—Radium Emanator Filter Co. Inc. has been incorporated with $100,000 capital to manufacture filtering devices by Arthur A. V. Ginoti, Haledon, N. J.

UNION CITY, N. J.—Baker Oil Burner Corp. of New Jersey has been incorporated with $100,000 capital, by P. F. Cullum, Union City.

TRENTON, N. J.—Barbour Iron Works, Marion street, will build a 1-story addition 75 x 150 feet. Walter Hankin, 224 East Hanover street, is architect.

WASHINGTON, N. J.—Washington Brass Foundry, formerly owned by Cochran Brothers, is being enlarged by an addition to the building and installation of five pit brass furnaces.

BROOKLYN, N. Y.—Utility Steel Sales Corp. has been incorporated with 200 shares no par value by J. G. Turnbull, New York.

BROOKLYN, N. Y.—Dovel Engineering Corp. has been incorporated with $5000 capital to manufacture oil burners and stoves, by W. B. Murphy, 189 Montague street.

BROOKLYN, N. Y.—McKibben Metal Co. has been incorporated with $10,000 capital to conduct a scrap metal business, by A. Miles, 815 Broadway, New York.

BUFFALO—Houde Engineering Corp., 1392 West avenue, will build a 1-story addition to increase its output of shock absorbers.

BUFFALO—Cole-Naylor Mfg. Co. has been incorporated with $50,000 capital to manufacture bronze and brass, by Morey & Schlenker, Buffalo.

FULTON, N. Y.—Sealright Corp., M. Paddock president, is having plans drawn for a 2-story addition to its plant, to cost $250,000.

HOOSICK FALLS, N. Y.—Murbur Mfg. Co. has been incorporated with $50,000 capital to manufacture bathroom fixtures, by S. F. Scott, Hoosick Falls.

HUDSON FALLS, N. Y.—Indian Lake Power & Light Corp. has been incorporated with $20,000 capital, by W. E. Congdon, Hudson Falls.

JAMAICA, N. Y.—F. R. Smith, 9219 New York avenue, is having plans made for a warehouse and distribution plant at Creedmoor, L. I., which includes a machine shop, 65 x 80 feet. Plans are being drawn by Morrell Smith, 161 Jamaica avenue.

LONG ISLAND CITY, N. Y.—Smith, Hanburg & Scott Welding Co., C. Scott, president, Marion place, is having plans made for a plant on Van Alstyne avenue, near Harris avenue.

NEW YORK—Federal Dumb Waiter Lock System has been incorporated with $10,000 capital by H. J. Block, 1476 Broadway.

NEW YORK—Patent Development Corp. has been incorporated with 1000 shares no par value by Spence, Hopkins & Walser, 52 Wall street.

NEW YORK—Grand Engineering Works has been incorporated with $20,000 capital by A. Friedman, 233 Broadway.

NEW YORK—Hoist & Crane Engineering Co. has been incorporated with $20,000 capital by H. E. Cecil, 120 Liberty street.

NEW YORK—Stabilated Spring Co., 2241 Fifth avenue, has been incorporated with $24,000 capital to manufacture auto springs.

NEW YORK—Coast Supply & Equipment Corp. has been incorporated with $25,000 capital to make engines, by J. Gold, 1440 Broadway.

NEW YORK—New York Electromatic Mfg. Corp. has been incorporated with $100,000 capital to manufacture steamfitting equipment, by Parker & Aaron, 30 Broad.

NEW YORK—Digit Mfg. Co. has been incorporated with 1000 shares no par value to manufacture electrical appliances, by S. S. Menken, 52 William street.

NEW YORK—Luralite Corp. has been incorporated with 100 shares no par value to manufacture gas and electric fixtures, by M. Dvorkin, 256 Broadway.

NEW YORK—Edward Hoffman Electric Co. has been incorporated with $10,000 capital to manufacture machinery, by J. H. Buckhard, Ridgewood, N. Y.

NEW YORK—National Electric Products Corp. has been incorporated with 100 shares no

Resale News

REAL ESTATE, machinery, equipment of the Temple Furnace Co., Temple, Pa., will be sold by the receiver, July 10, at the plant. Samuel T. Freeman & Co. are auctioneers. The sale will include the real estate, two 165-ton blast furnaces, seven 400-horsepower boilers, three blower engines, cranes, locomotives, cars, derrick buckets, track scales, steam generator set, steam pumps, air compressors, machine tools and miscellaneous articles and supplies.

* * *

Matthews Engineering Co., Sandusky, O., is liquidating its plant, after selling its manufacturing rights. Among materials offered for sale in liquidation are: Drill presses, shapers, drills, radial drills, floor grinders, lathes, turret lathes, milling machines, slab miller, grinders, key seaters, air compressors, hoists and other equipment.

Sales Calendar

July 8—Plant and equipment of Warren Iron & Steel Co., Warren, O., at public auction.

July 10—Receiver's sale of real estate, machinery and equipment of Temple Furnace Co., Temple, Pa.

par value, by Gelason, McLanahan, Merritt & Ingraham, 165 Broadway.

NEW YORK—Zeronator Ltd. has been incorporated with $50,000 capital and 600 shares no par value to manufacture tools, by M. L. Levine, 165 Broadway.

NEW YORK—Vira Mfg. Co. has been incorporated with $5000 capital to manufacture lamp shades and stands by L. Sandler, 21 East Fortieth street.

NEW YORK—Automatic Retailing Corp. has been incorporated with $100,000 capital to manufacture vending machines, by A. Castrolopez, 25 Broad street.

NEW YORK—Columbia Metal Box Co., 228 East 114th street, is having plans made by George A. Bagge & Sons, 157 East Forty-fourth street, architects, for a 2-story addition to its plant.

NEW YORK—John Hoffman Jr., 527 Hunts Point avenue, manufacturer of hoists and contractors' equipment, has had plans made by S. F. Oppenheim Inc., 156 East Forty-second street, for a 1-story addition 100 x 100 feet.

NEW YORK—New York & Queens Meter Service Corp. has been incorporated wtih $50,000 capital and 500 shares no par value to manufacture electrical apparatus, by S. H. Hauben, 305 Broadway.

NEW YORK—Machine and blacksmith shops are included in plans for the proposed $1,000,000 improvement at Roosevelt aviation field on Long Island. Paul Lannin, who owns the field, said that $500,000 has been set aside to handle work this summer.

NEW YORK—Ensign Reynolds Inc. has been incorporated with $250,000 capital to manufacture gas fired appliances, by George B. Cortelyou, president of the Consolidated Gas Co. of New York, 130 East Fifteenth street, Oscar H. Fogg, John A. Garver, Joseph W. Drake, Sheldon E. Smith and Chauncey B. Garver.

NEW YORK—A western coal product concern is negotiating with the department of docks for leasing 300 acres of city land on Jamaica bay, at Paerdegat basin, Brooklyn. The municipal sinking fund commission has set Aug. 13 as the date for a public hearing on the proposed lease. The coal product company is said to have a coal substitute which is manufactured by treatment of anthracite with oil.

NIAGARA FALLS, N. Y.—Carborundum Co. will build a 5-story warehouse. Laur & Mack Construction Co. has the general contract. The structure will be 80 x 244 feet.

OSWEGO, N. Y.—Fitzgibbons Boiler Co. Inc. will build a foundry adjoining its plant. Homer Adams, 570 Seventh avenue, New York, is president.

PERRYSBURG, N. Y.—Thrasher Mfg. Co. has been incorporated with $50,000 capital to manufacture tools and implements, by Catherine Thrasher, Perrysburg; Percy H. Smith, Dunkirk; James E. Bixby, Gowanda, N. Y.

ROCHESTER, N. Y.—Trus Gas has been incorporated with 1000 shares no par value to manufacture gas engines and burners, by R. S. Garson, Rochester.

ROME, N. Y.—Fort Stanwix Mfg. Co. has been incorporated with $36,000 capital to make dies, by Powers & Powers, Rome.

SYRACUSE, N. Y.—U. S. Hoffman Machinery Corp., H. W. Stone, 329 Temple street, Syracuse, manager, has let contract to Dawson Bros., 231 Union building, Syracuse, for a group of 1 and 2-story factory buildings. Lockwood-Green Co., 100 East Forty-second street, New York, is architect and engineer.

ERIE, PA.—Anderson Pattern Works, 924 West Twelfth street, is rebuilding its burned plant.

PHILADELPHIA—Brown Instrument Co., manufacturer of recording and indicating devices, is building an addition 44 x 60 feet, two stories. Foundations provide for additional floors. It will be devoted largely to research facilities.

East Central

AURORA, ILL.—Aurora Foundry Co., 385 Spruce street, has let contract for a 1-story addition, 45 x 140 feet.

CHICAGO—Miehle Printing Press & Mfg. Co., W. V. Kelley, president, Robey and Fourteenth streets, is taking bids on a 4-story addition to its manufacturing plant. Weiss & Niestadt, 53 West Jackson boulevard, are architects.

CHICAGO—Consunised Corp. has been incorporated with 100 shares no par value to manufacture and deal in equipment, and supplies for light radiators, by Earl L. Heverly, T. C. Russell and H. W. Chittick. Will A. Kelly, 111 W. Monroe street, is correspondent.

CHICAGO—Nu-Century Window Mfg. Co. has been incorporated with $50,000 capital to manufacture and deal in window frames, sashes, doors, and hardware, by Gustav Carl, Gustav H. Carl and Otto C. Schwartz. Emil F. Link, Burnham building, suite 1138, is correspondent.

CHICAGO—Tripoint Vacuum Cleaner Co. has been incorporated with $50,000 capital to manufacture vacuum cleaners and other mechanical cleaning devices, etc., by Henry J. Smidley, Emma Smidley and William Meier. John Alden Ryan, 160 North LaSalle street, is correspondent.

CHICAGO—Charles E. Evans & Co., 77 West Washington street, room 1848, has been incorporated with $25,000 capital to build and install heating plants and systems and boilers, by Charles E. Evans, M. B. Evans and William H. Severin. Sieble & Severin. 77 West Washington street, are correspondents.

PRINCETON, ILL.—Board of supervisors, Bureau county, R. L. Schoonberger, county engineer, American Hotel building, is having plans drawn, for bids in fall, for a 1-story machine and repair shop.

ROCKFORD, ILL.—Barnes Drill Co. machine tool manufacturer, has let contract to Security Building Co., 1016 Charles street, for a 1-story addition 80 x 145 feet.

ROCK ISLAND, ILL.—Tri-City Steel & Supply Co. has been incorporated with $40,000 capital to deal in iron and steel and other metals, by Frank W. Black, Edward A. and Carl R. Hesler, and George W. Baldwin. Huber & Reidy, 210 Manufacturers Trust Bldg., are correspondents.

INDIANAPOLIS—Van Camp Hardware & Iron Co., 401 West Maryland street, will build a 1-story pipe shop, 80 x 180 feet.

INDIANAPOLIS—Crown Machine Co., Newton avenue and Tuxedo street, will rebuild its burned plant.

DETROIT—Briggs Mfg. Co. has awarded to Whitehead & Kales the steel for its storage building addition.

DETROIT—Rich Products Co., A. W. Flinterman, president, manufacturer of automotive parts, announces that equipment of its Marshall plant will be started July 1. Output is designed to be 2,000,000 tappets a month.

DETROIT—National Die Casting Co. has been incorporated with $65,000 capital to manufacture die casting machinery and equipment, by George L. Thompson, 160 LaSalle street, Royal Oak, Mich., John Warth and G. A. Warth, Highland Fark, Mich.

DETROIT—Griswold Safety Signals Inc. has been incorporated with $50,000 capital and 12,000 shares no par value to manufacture safety signal devices and other products, by William E. Manhard, 713 Ford building, B. H. Durst, Detroit, Charles A. Luck, Highland Park, Mich.

HIGHLAND PARK, MICH.—Triangle Cornice & Roofing Co., 113 Victor avenue, has been incorporated with $10,000 capital to manufacture sheet metal cornices and other sheet metal products, by Samuel Moline, 292 LaBelle avenue, Pauline and Rose Moline.

MUSKEGON, MICH.—Rodgers Boiler & Burner Co. is planning to rebuild its burned plant.

MUSKEGON, MICH.—Standard Automotive Parts Co. will build a 1-story foundry and laboratory. Frank P. Allen & Son, Grand Rapids, Mich., are architects.

SAGINAW, MICH.—Chevrolet Motor Co. is having land prepared by Albert Kahn, Detroit, for four factory buildings to be erected here.

CLEVELAND—Hoffman Body Co. has been incorporated with 500 shares no par value by William H. Hoffman, C. A. Benner and G. H. Krueger.

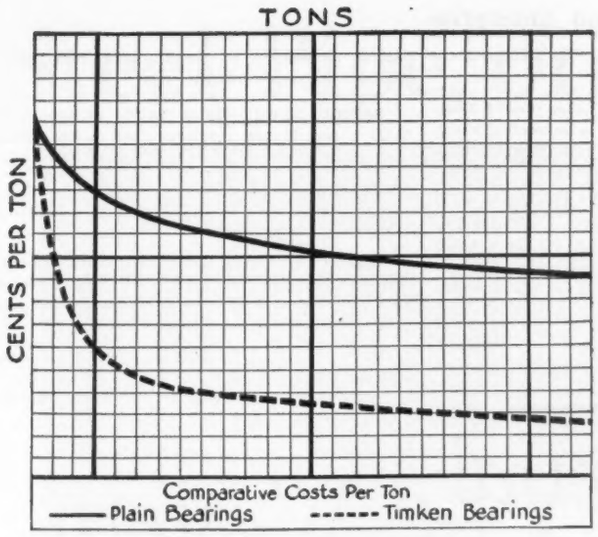
CLEVELAND—California-Ohio Steel & Tin Plate Co. has been incorporated with 300 shares no par value by J. H. Metzler, Charles Rinaldo and H. R. McCann.

COLUMBUS, O.—Midland Furnace Co. has been incorporated with $750,000 capital by Henry A. Williams, Ralph H. Klapp and Lucille S. Black.

BARABOO, Wis.—Northwestern Refrigerator Co. has started work on a stencil cutting building, 20 x 40 feet, and will soon start work on a storage building, 30 x 150 feet.

MILWAUKEE—Asbestos Insulating Materials Inc., L. S. White president, 1245 Twenty-third

(*Continued on Page* 68)



COSTS

Are Your Production Costs as low as they Could be?

Roll neck bearings bear a close relation to overall production costs. The rolling mill is the neck of the bottle in steel mill production. Power costs, maintenance expense, production delays, rejections; everything piles up there.

Timken Bearings eliminate a lot of the items that would help to swell production costs. They reduce others to negligible quantities. Power demand falls off. Maintenance and lubrication expenses are cut to the bone. Production volume is increased, and the percentage of rejected material diminished. Steel is produced at considerably fewer cents per ton.

These benefits are permanent. Timken Tapered Construction, Timken *POSITIVELY ALIGNED ROLLS* and Timken-made Electric Steel put an indestructible lid on rising production costs.

THE TIMKEN ROLLER BEARING CO., CANTON, OHIO

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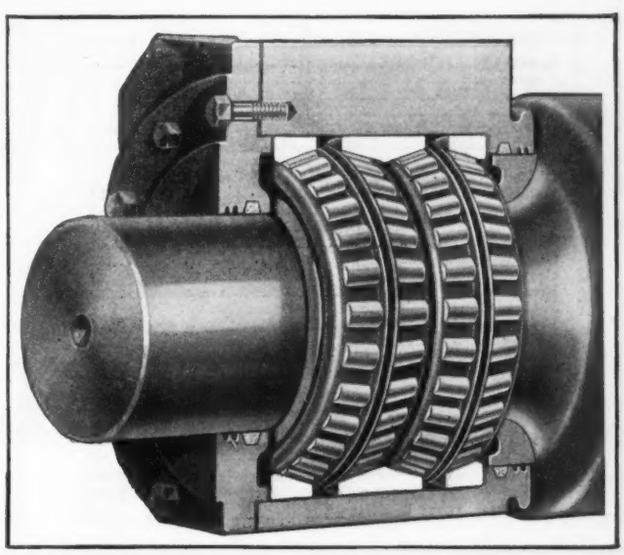


Construction and Enterprise

(*Continued from Page* 66)

street, is having plans made for a plant, to be built in the fall.

NEW LONDON, WIS.—Hamilton & Sons are having plans prepared by Victor Thomas, architect, New London, for a 2-story canning factory addition, 60 x 150 feet.

RACINE, WIS.—Armstrong Foundry Co., 1530 Junction avenue, gray iron castings, will build a 1-story addition, 75 x 80 feet. J. Mandor Matson, Racine, is architect.

SUPERIOR, WIS.—Great Lakes Coal & Dock Co. will soon take bids for a screening plant at St. Louis bay, to cost $25,000. Wm. C. Nelson, Plymouth building, Minneapolis, is president.

STEVENS POINT, WIS.—Weber Lifelike Fly Co., O. L. Weber, president, has let the general contract to Fluor Bros. Construction Co., 52 Otter street, Oshkosh, for a 2-story factory, 60 x 120 feet.

West Central

CLINTON, IOWA—Lubbers & Bell Mfg. Co., manufacturer of hardware specialties, 200 North Second street, is having plans made for a 1-story factory, 84 x 160 feet. A. N. Morrell, Clinton, is architect.

DAVENPORT, IOWA—Blackhawk Foundry & Machine Co., 323 Clark street, has let a contract to Priester Construction Co., Kahl building, for a 1-story foundry, 42 x 92 feet.

FORT, DODGE, IOWA—Atomized Fuel Corp. has let a contract to the Pennsylvania Engineering Co., New Castle, Pa., for a 1-story fuel plant, 50 x 125 feet.

WATERLOO, IOWA—Headford Bros. & Hitchens Foundry Co. will make extensive remodeling to its 120 x 300-foot foundry on Westfield avenue. E. H. Headford is president.

WATERLOO, IOWA—John Deere Tractor Co. is taking bids for a number of buildings at Commercial avenue and Miles street, including a tunnel building, foundry, mill building and power house. Allen H. Head is vice president and general manager.

ALBERT LEA, MINN.—Olson Mfg. Co., manufacturer of barn equipment and commercial ventilating systems, has let the general contract to Tapager Construction Co., Home Investment building, for a 1-story factory.

LAKE CITY, MINN.—Gillette & Eaton Iron Works is building an addition to its foundry on Eighth street north.

MINNEAPOLIS—O. B. McClintock Co., 135 Lyndale avenue north, O. B. McClintock, president, manufacturer of burglar alarms, will build 2-story factory.

OWATONNA, MINN.—Jos. J. Kovar Co. Inc. has been incorporated with a capital of $200,000 to manufacture tools and machinery. John R. Kovar is president.

TRUMAN, MINN.—Bids will be received by E. G. Gruening, village recorder, until July 10, for a 75,000-gallon steel water tank on a 100-foot tower. Toltz, King & Day Inc., Builders Exchange building, St. Paul, are engineers.

ST. LOUIS—George A. Morrisey, St. Louis, has bought ten acres in East St. Louis, Ill., commercial district and will build a coal distillation plant of his own design for production of coke and by-products.

McCOOK, NEBR.—Helm Well Co., headed by Arthur C. Helm, has been incorporated with a capital of $50,000 to manufacture metal well casings, pumps, windmills, etc.

OMAHA, NEBR.—Union Pacific railroad will build a roundhouse, machine shop, boiler house and pump house.

OMAHA, NEBR.—Union Pacific railroad is having plans made for a 12-story office building addition, 57 x 95 feet.

FARGO, N. DAK.—Great Northern railroad, Railroad building, St. Paul, has let a contract to T. F. Powers & Co., Fargo, for a 10-stall engine house and power plant.

GRAND FORKS, N. DAK.—Great Northern railroad, Railroad building, St. Paul, has let a contract to Carl G. Steen, Grand Forks, for an 18-stall engine house and machine shop.

Western States

PUYALLUP, WASH.—Winner Tool Co. has increased its capital to finance additions to its plant for enlarged operations.

SPOKANE—Crescent Machine Works, 815 Monroe street, has bought plant at 831 Monroe street, which will be remodeled and equipped for enlarged operations.

FAYETTEVILLE, ARK.—Claude H. Sanford will build a machine shop plant on North West street.

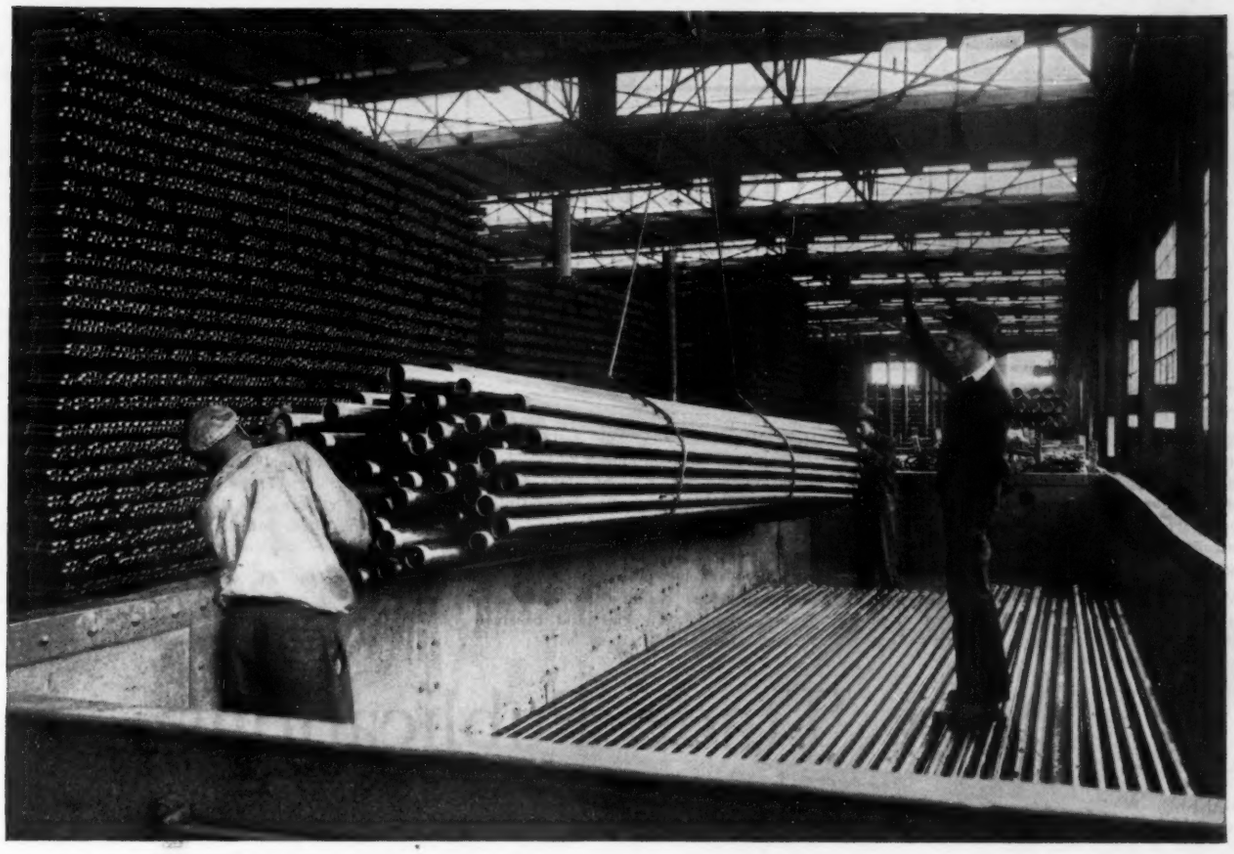
KNOXVILLE, TENN.—Hicks Sheet Metal Works Inc. has been incorporated with $5000 capital by Irl A. Hicks, Charles F. Benziger, F. A. Jones, E. P. Hicks and Harry S. Hyman.

(*Concluded on Page* 70)

Where Machinery Exports Went in April

	Lathes: Engine	Lathes: Turret	Lathes: Other	Gear cutters	Planers Milling knee column	Machines other	Pneumatic portable tools
Russia	.....	.....	.....	1	.....	.....	.....
France	1	.....	3	9	2	.....	382
Germany	2	26	49	1	3	1	32
Italy	2	.....	.....	.....	.....	1	35
Netherlands	.....	.....	28	1	.....	.....	15
Spain	.....	.....	.....	.....	3	.....	106
Sweden	3	1	1	.....	1	1	.....
United Kingdom	9	1	.....	8	3	1	448
Canada	11	10	30	8	2	20	225
Mexico	1	.....	1	.....	1	1	10
Cuba	.....	.....	.....	1	.....	.....	27
Argentina	.....	.....	.....	.....	.....	.....	328
Colombia	.....	.....	1	.....	.....	.....	14
Chile	1	.....	1	.....	.....	.....	1
Brazil	.....	.....	1	.....	.....	1	393
Japan, Chosen	2	.....	.....	.....	.....	2	103
Philippine Islands	1	.....	.....	.....	.....	.....	.....
Australia	.....	.....	1	.....	.....	.....	66
British South Africa	1	.....	.....	.....	.....	.....	87
Venezuela	.....	.....	.....	.....	.....	.....	3
Other countries	5	3	9	1	4	15	187
1928							
April	39	41	125	30	19	43	2,462
March	95	29	33	26	33	47	1,928
February	68	30	53	24	24	51	.....
January	66	26	57	31	30	81	.....
Total, 1927	716	280	444	379	270	491	.....

Steel Pipe, ordered *today* . . .



on its way to you *tomorrow*

IN these days of hand-to-mouth buying it is not always possible to anticipate requirements. Over night, a situation may arise necessitating a rush shipment of steel pipe.

The new Bethlehem Pipe Mills, at Maryland Plant, Sparrows Point, Md., near Baltimore, are especially well organized and equipped to meet just such an emergency. The facilities for storing pipe are exceptional, and a large, well-assorted stock is constantly maintained. An order for any except a most unusual quantity or size can be filled immediately.

A complete stock plus favorable location of the mills and remarkable shipping facilities

underlie the steel pipe service that Bethlehem offers. Three trunk-line railroads enter Maryland Plant; consequently prompt inland shipments can be made. And the location of Maryland Plant on tide-water permits equally prompt shipments by steamer to points on the Atlantic Seaboard and on the Gulf and Pacific Coasts. The steel pipe can be loaded directly into the vessel at the plant.

You can obtain Bethlehem Steel Pipe through your jobber. If an immediate shipment is required, a wire or phone message to the nearest Bethlehem District Office today will cause the pipe to be loaded and on its way to you tomorrow.

BETHLEHEM STEEL COMPANY, *General Offices:* BETHLEHEM, PA.

District Offices: New York Boston Philadelphia Baltimore Washington Atlanta Pittsburgh Buffalo Cleveland Detroit Cincinnati Chicago St. Louis San Francisco Los Angeles Seattle Portland

Bethlehem Steel Export Corporation, 25 Broadway, New York City, Sole Exporter of our Commercial Products

Bethlehem Steel Pipe is the product of a complete steel producing organization

BETHLEHEM STEEL PIPE

The name "Bethlehem" appears at intervals on every length of Bethlehem Steel Pipe

Construction and Enterprise

(*Concluded from Page* 68)

Canada

CALGARY, ALTA.—Calgary Power Co., 315 Herald building, has started construction of a power development plant at Ghost river.

KILGARD, B. C.—Clayburn Brick Co., J. W. Ball, local manager, proposes to make extensive additions to its plant here to double capacity and install machinery for the manufacture of special types of brick and allied products. The controlling shareholders of the company are Roger Miller & Sons, Toronto, Ont.

VANCOUVER, B. C.—British Columbia Electric Railway Co. has awarded contract to C. C. Moore & Co., Vancouver and San Francisco, for a steam electric plant on Burrand Inlet, B. C. The plant is to be completed by Sept. 1, 1932. The contract is for the first of four 20,000-kilowatt turbo generating units.

WINNIPEG, MAN.—Large expansion program is proposed for this year by Western Steel Products Ltd., Winnipeg, Man. The company will build additions to a number of plants and has purchased land at Winnipeg, Man., Regina and Saskatoon, Sask., Calgary and Edmonton, Alta.

ANTIGONISH, N. S.—Town council, John F. MacLellan chairman, has decided on additions to its plant and equipment to supply additional light and power. Present plans call for an oil engine of 120 horsepower, generating unit, etc.

HAMILTON, ONT.—Soper & Kent, 41 McNab street north, are having plans prepared by W. L. Walsh, 304 Terminal building, for a factory and office building on Main street, near Walnut street, 3 stories and basement, 30 x 92 feet, steel and brick.

MATTAWA, ONT.—J. H. Bell Co. Ltd. has been incorporated to manufacture and deal in hardware, with $50,000 capital by John H. Bell, Charles S. McGaughey, and Irene Robson.

TORONTO, ONT.—Dominion Bridge Co., will build an addition to its plant on Sorauren avenue, for the fabricating of structural steel of a heavier type than is possible at present.

TORONTO, ONT.—Hydroelectric power commission of Ontario, University avenue, Toronto, has approved construction of a third power unit for the Nipissing system at Elliott Chutes. The total installation will be about 1800 horsepower, and construction will be started this summer.

TORONTO, ONT.—Link-Belt Ltd. has commissioned Ewart, Armer & Byam Ltd., architects and engineers, to prepare plans for a machine shop adjoining the present plant at Eastern avenue and Leslie street, 105 x 120 or 160 feet, a 45-foot center bay and two 30-foot side bays. Connecting this unit and the present plant will be a 50 x 50-foot shipping building. Crane equipment will comprise a 10-ton and 3-ton bridge crane, a 5-ton crane in shipping unit running to the center bay of the machine shop. Bids will be asked by the middle of July, to have construction start about Aug. 1.

MONTREAL, QUE.—Reid Bros., 511 St. Catharine street west, have the contract for addition to the plant of the Canadian Tube & Steel Products Ltd., 107 Hamilton street.

New Trade Publications

BAFFLE WALL—Boiler Engineering Co., Newark, N. J., has issued a bulletin comparing two types of baffle wall built by this company. It is illustrated with halftones and diagrams.

ELECTRIC STEEL CASTINGS—Lebanon Steel Foundry, Lebanon, Pa., in a current bulletin calls attention to the need for castings that will not fail under greatest strain. Dependability of its steel is stressed.

FLASKS—Slip flasks, adjustable jackets and snap flasks are described in a recent bulletin of the Osborn Mfg. Co., 5401 Hamilton avenue, Cleveland. Special features of construction are presented.

LADLES—Helical-worm geared ladles are described in a recent bulletin of the Whiting Corp., 15607 Lathrop avenue, Harvey, Ill. The dimensions for standard helical-worm geared ladles also are given.

MAGNETIC CLUTCHES—Magnetic Mfg. Co., Milwaukee, has issued an 8-page folder describing the construction and operation of its line of magnetic clutches. Horsepower, rating and dimensions are included.

PUMPS—Hayton Pump & Blower Co., Appleton, Wis., has issued a bulletin on its centrifugal and triplex pumps and chrome steel pumps for mine waters. It is illustrated to show the pumps and parts.

PRESSES—Niagara Machine & Tool Works, Buffalo, has issued two bulletins, one on foot and screw presses and the other on double-crank power presses. Both are illustrated and present full specifications and data.

CUPOLA CHARGERS—Whiting Corp., Harvey, Ill., has prepared a folder showing the construction of its new type of cupola charging equipment, in which the charging bucket is held in the cupola by a supporting casting and the bottom is allowed to drop.

ELECTRICAL EQUIPMENT—Recent bulletins by the General Electric Co., Schenectady, N. Y., include: Squirrel-cage induction motors; travel carriage for automatic arc welders; direct-current mill motors; magnetic switch; sheath wire resistor units.

GRAPHIC RECORDERS—Accurate measurement of productive labor effort in industry is illustrated in a bulletin by the Esterline-Angus Co., Indianapolis. Lateness, loafing and full production of any department are shown by the recorder, a wattmeter on the power line.

NONFERROUS SPECIFICATIONS—Niagara Falls Smelting & Refining Corp., Buffalo, has prepared a leaflet containing United States navy specifications for nonferrous alloys. They are in tabular form, with notes on purposes to which they are best applied.

PULVERIZERS—Grindle Fuel Equipment Co., Harvey, Ill., has issued a bulletin describing its multi-stage unit pulverizer for preparing coal for powdered fuel systems. Constructional details are given and photographs show the equipment installed in several malleable foundries.

CHEMICAL MICROSCOPE—E. Leitz Inc., 60 East Tenth street, New York, manufacturer of laboratory equipment and microscopes, has issued a bulletin describing its universal chemical microscope and attachments adapting it to a wide variety of uses. Complete data for ordering are included.

ROOF DESIGNS—David Lupton's Sons Co., Philadelphia, has issued a folder illustrating the use of the pond type roof and continuous windows to provide natural light and ventilation in foundries. Photographs and diagrams illustrate the movement of heated air in buildings constructed with that type of roof.

EXTRUDED METAL—Taunton-New Bedford Copper Co., in a current bulletin, calls attention to wide possible uses of extruded metal shapes. An application of an extruded shape to the manufacture of hinges is illustrated. Reduction of costs and superior quality are claimed. Suggestions as to possible uses are made. The circular is unusually effective and informative.

JIG BORING MACHINE—R. Y. Ferner Co., Investment building, Washington, representative of the Societe Genevoise, Geneva, Switzerland, has issued a booklet suggesting questions to be asked before buying a jig boring machine. The questions are asked and answered from the standpoint of the company. Illustrations supplement the answers. Full details of the company's equipment are covered.

ARC WELDERS—Lincoln Electric Co., Cleveland, has issued a bulletin in which variable-voltage, single-operator and constant-potential, multiple-operator arc welders are compared. The discussion covers first cost of equipment and installation, the problem of interference between operators, and economy of power of variable voltage equipment. Curves show the latter.

PICKLING EQUIPMENT—Duriron Co. Inc., Dayton, O., manufacturer of corrosion-resistant metals, is circulating a booklet on pickling equipment, pointing out advantages of its products in this connection. It is well illustrated and the pickling process is described in its various steps. For further and more detailed information on this process the booklet refers the reader to the series on "Practical Features of Pickling," by Wallace G. Imhoff, printed in IRON TRADE REVIEW and now in book form by the Penton Publishing Co.

MOLDING MACHINE—Osborn Mfg. Co., Cleveland, has published a catalog, featuring its complete line of jolt-squeeze molding machines. The first portion is devoted to an illustrated description of the standard procedure in making a mold on this type of machine. Advantages of that type are listed. A considerable portion is devoted to constructional data of the molding machine, tapered slip flasks and accessories. The last section contains considerable information of value to the foundryman, including material on the design of match plates, method of making cast match plates, assembled match plates and match plates for small quantity production.

Where Can You Match this Steering?

Steer in an easy curve with power on both crawlers if you like, because either crawler belt can be operated at a slower speed and with any degree of power required.

Or, as the corners get sharper, take all the power off the belt in the direction you want to turn and apply the brake, if you need it. Then watch the machine turn around.

All steering on this DC shovel crane is controlled from the operator's position and operates entirely independent of all other motions. There are two travel speeds.

You can't beat this 1⅛-yard machine anywhere for shovel value and performance.

Industrial Brownhoist Corporation

General Offices: Cleveland, Ohio.

District Offices: New York, Philadelphia, Pittsburgh, Detroit, Chicago, St. Louis, San Francisco, New Orleans, Bay City, Mich.

INDUSTRIAL BROWNHOIST

Discounts and Extras

Steel Pipe

Pittsburgh and Lorain basing discounts, jobber's carloads.

Evanston, Ill., and Indiana Harbor, Ind., take differential 2 points less discount.

Chicago takes differential 2½ points less than Pittsburgh-Lorain basis.

Butt Weld

	Black	Galvanized
⅛-inch	45	19½
¼ and ⅜-inch	51	25½
½-inch	56	42½
¾-inch	60	48½
1 to 3-inch	62	50½
Lap Weld		
2-inch	55	43½
2½ to 6-inch	59	47½
7 to 8-inch	56	43½
9 and 10-inch	54	41½
11 and 12-inch	53	40½
REAMED AND DRIFTED		
Butt Weld		
1 to 3-inch	60	48½
Lap Weld		
2-inch	53	41½
2½ to 6-inch	57	45½
EXTRA STRONG—PLAIN ENDS		
Butt Weld		
⅛-inch	41	24½
¼ and ⅜-inch	47	30½
½-inch	53	42½
¾-inch	58	47½
1 to 1½-inch	60	49½
2 to 3-inch	61	50½
Lap Weld		
2-inch	53	42½
2½ to 4-inch	57	46½
4½ to 6-inch	56	45½
7 to 8-inch	52	39½
9 and 10-inch	45	32½
11 and 12-inch	44	31½
DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	42	32½
¾ to 1½-inch	45	35½
2 to 2½-inch	47	37½
Lap Weld		
2-inch	41	32½
2½ to 4-inch	43	34½
4½ to 6-inch	42	33½
7 to 8-inch	38	25½

(Note—Large jobbers obtain additional preferential discounts of 1 and 5 on black and 1½ and 5 on galvanized. Extra 5 per cent granted in the 4th quarter 1927 and 1st quarter 1928 discontinued April 2, 1928.)

Wrought Iron Pipe

Pittsburgh basing discounts, jobbers' carloads. Individual quotations made on delivered basis.

THREADS AND COUPLINGS

Butt Weld		
¼ and ⅜-inch	+11	+39
½-inch	22	2
¾-inch	28	11
1 to 1½-inch	30	13
Lap Weld		
1¼ and 1½-inch	Upon application	
2-inch	23	7
2½ to 3-inch	26	11
3 to 6-inch	28	13
7 to 12-inch	26	11
PLUGGED AND REAMED		
Two points less than above		
EXTRA STRONG, PLAIN ENDS		
¼ and ⅜-inch	+19	+54
½-inch	21	7
¾-inch	28	12
1 to 1½-inch	30	14
Lap Weld		
2-inch	23	9
2½ to 4-inch	29	15
4½ to 6-inch	28	14
7 to 8-inch	21	7
9 to 12-inch	16	2

DOUBLE EXTRA STRONG

Butt Weld		
½-inch	+47½	+59½
¾-inch	+28	+40
1-inch	+34	+46
1¼-inch	+28	+40
1½-inch	+27	+39
Lap Weld		
2 and 2½-inch	+13	+25
3 and 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	.....

(Note—Large jobbers obtain additional preferential discounts of 1, 5 and 2½ on black and galvanized.)

Boiler Tubes

Pittsburgh carload discounts. Less carloads 4 points less

STEEL (Lap Weld)

2 and 2¼-inch	27 off
2½ and 2¾-inch	37 off
3-inch	40 off
3¼ to 3¾-inch	42½ off
4 to 13-inch	46 off

(Note—Additional discounts of six extra 5 per cents now being given on 21,000 pounds or more.

CHARCOAL IRON

1½-inch	+18
1¾-inch	+ 8
2 and 2¼-inch	2 off
2½ to 3-inch	7 off
3¼ to 4½-inch	9 off

(Note—Additional discounts of two 10's and one 2½ now being given on 12,000 pounds or more.)

SEAMLESS COLD DRAWN

1-inch	56 off
1¼ and 1½-inch	48 off
1¾-inch	32 off
2 and 2¼-inch	27 off
2½ and 2¾-inch	35 off
3-inch	41 off
3¼ and 3½-inch	43 off
4-inch	46 off
4½, 5 and 6-inch	41 off

SEAMLESS HOT ROLLED

2 and 2½-inch	30 off
2½ and 2¾-inch	38 off
3-inch	44 off
3¼ and 3½-inch	46 off
4-inch	49 off
4½, 5 and 6-inch	44 off

(Note—Additional discounts of 2 or 3 extra 5 per cents now being given.)

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras:

Add $8 per ton for more than four gages heavier than standard and add 10 per cent to theoretical weight.

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING

Base Discounts on New List July 1, 1925

Carbon 0.10 to 0.30 per cent.....50 to 55 off
Carbon 0.30 to 0.40 per cent.....45 to 50 off

SEAMLESS STEEL LOCOMOTIVE AND SUPERHEATER TUBES

Outside diameter	Gage	Net prices per foot f.o.b. Pittsburgh Price
2-inch	12-gage	14¼c
2-inch	11-gage	15c
2-inch	10-gage	16c
2¼-inch	12-gage	16c
2¼-inch	11-gage	17c
2¼-inch	10-gage	18c
3-inch	7-gage	33c
5⅜-inch	9-gage	50c
5½-inch	9-gage	52c

Plus usual extras for forming and for long lengths over 18 feet and for commercially exact lengths.

Plate Extras

BASE

Rectangular plates, tank steel or conforming to manufacturers' Standard Specifications for structural steel, dated Nov. 24, 1922, or equivalent, ¼-inch thick and over on thinnest edge, (except for ¼-inch or 72 inches wide when ordered to weight in pounds per square foot—see width and gage extras), 100 inches wide and under, down to but not including 6 inches wide, 5 feet 0 inches long up to published limit in length but not over 80 feet 0 inch, are base. Extras per pound for width or diameter.

All Plates Rectangular or Otherwise

¼-inch thick and heavier, but not less than 11 pounds per square foot, if ordered to weigh—

Over 100 inches to and including 110 inches	.05c
Over 110 inches to and including 115 inches	.10c
Over 115 inches to and including 120 inches	.15c
Over 120 inches to and including 125 inches	.25c
Over 125 inches to and including 128 inches	.50c
Plates less than ¼-inch or lighter than 11 pounds per square foot.	
Over 72 inches to and including 84 inches	.10c
Over 84 inches to and including 96 inches	.20c
Over 96 inches to and including 100 inches	.30c

Over 100 inches add .35c to width extras for plates ¼-inch thick and heavier.

GAGE

Plates Not Exceeding 72 Inches Wide

Plates less than ¼-inch gage, to and including 3/16-inch; or lighter than 10.2 pounds per square foot, to and including 7.65 pounds per square foot ..... .20c

Plates Over 72 Inches Wide

Plates less than ¼-inch gage, to and including 3/16-inch; or lighter than 11 pounds per square foot, to but not including 7.65 pounds per square foot ..... .20c

Plates ordered 7.65 pounds per square foot ..... .30c

QUALITIES

Pressing steel	.10c
Flange steel (boiler grade)	.15c
Ordinary firebox steel	.20c
Stillbottom steel	.30c
Locomotive firebox steel	.50c
Marine steel	1.50c
Hull materials subject to U. S. Navy Dept. specifications for medium or soft steel	.10c
High tensile hull steel subject to U. S. Navy Dept. or equivalent specifications	1.00c
Boiler steel subject to U. S. Navy Dept. specifications, classes A and B	1.50c

Hull plates to hull specifications, required to stand cold flanging, take extra for flange steel.

Floor Plates

Checkered plates 1.75c

Checkered plates are not furnished to sketch and are rolled from "Stock Steel" only. No physical tests will be made on checkered plates.

INSPECTION

Mill inspection .....No extra

Charges for other inspection, such as Lloyd's or American bureau of shipping, will be made by inspection bureau direct to buyer.

CUTTING

LENGTH OR DIAMETER

All Plates, Rectangular or Otherwise

Five feet and over up to published limit of length, but not over 80 feet	No extra
Under 5 feet to 3 feet inclusive	.10c
Under 3 feet to 2 feet inclusive	.25c
Under 2 feet to 1 foot inclusive	.50c
Under 1 foot	1.55c
Over 80 feet to 100 feet inclusive	.10c

Over 100 feet add .25c plus .05c for every additional 2 feet or fraction thereof.

Regular Sketches

With not more than four straight cuts. (Including straight taper plates)

Additional extra ..... .10c

Irregular Sketches

With not more than four straight cuts. (Sketches cannot be sheared with re-entrant angles)

Additional extra ..... .20c